R&D STATISTICS

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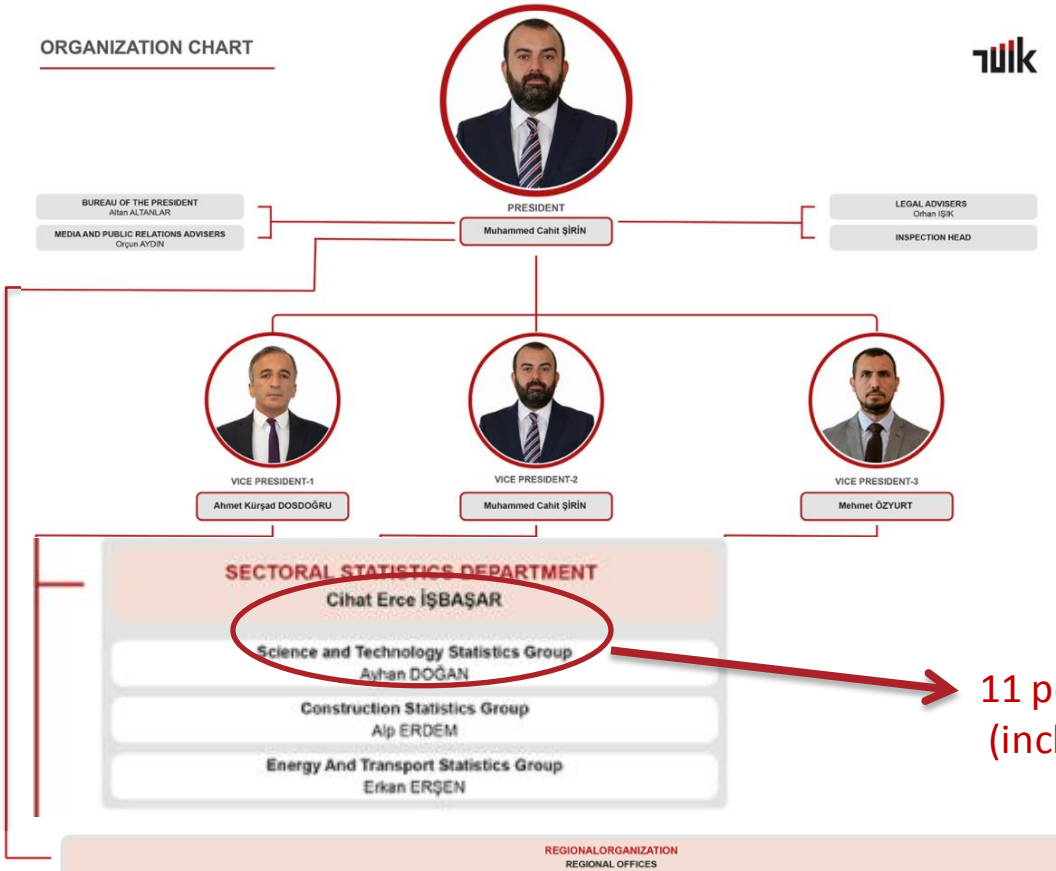
Content

- Organisational structure in TurkStat
- Concepts and definitions and methodological base
- Classifications
- Coverage and statistical units
- Survey design
- Data collection
- Measurement and analysis
- Dissemination

Organisational structure in TurkStat

TURKISH STATISTICAL INSTITUTE

ORGANIZATION CHART



11 personnel
(incl. head of unit)

Central Organization

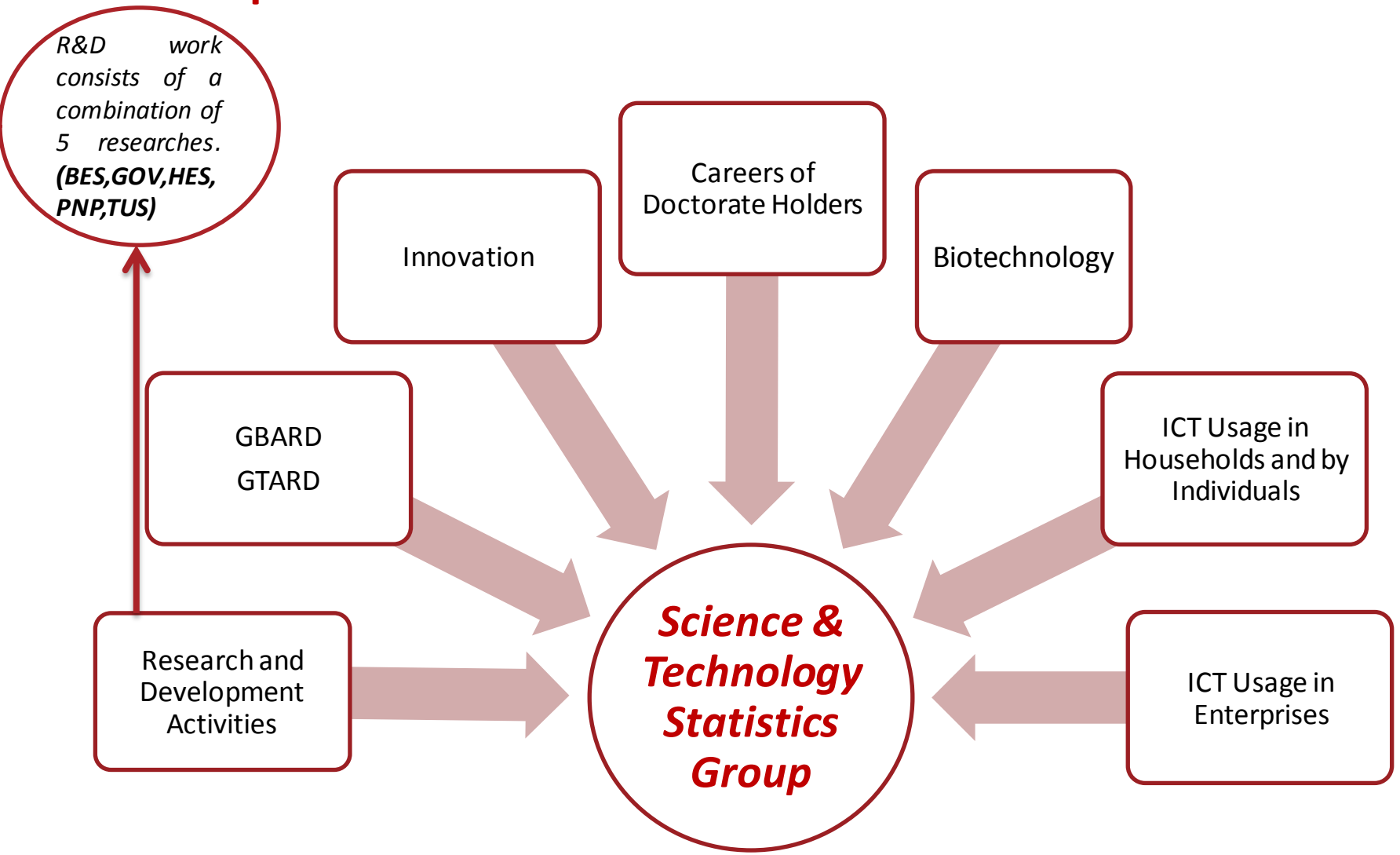
- *Managing the Turkish Statistical System*
- *Planning*
- *Coordination*
- *Methodological Studies*
- *Analysing*
- *Processing*
- *Dissemination*

Regional Offices (26)

- *Compiling*
- *Evaluating*
- *Controlling*
- *Analyzing*
- *Transferring*

Science & Technology Statistics Group

Statistics produced



Concepts and definitions and methodological base

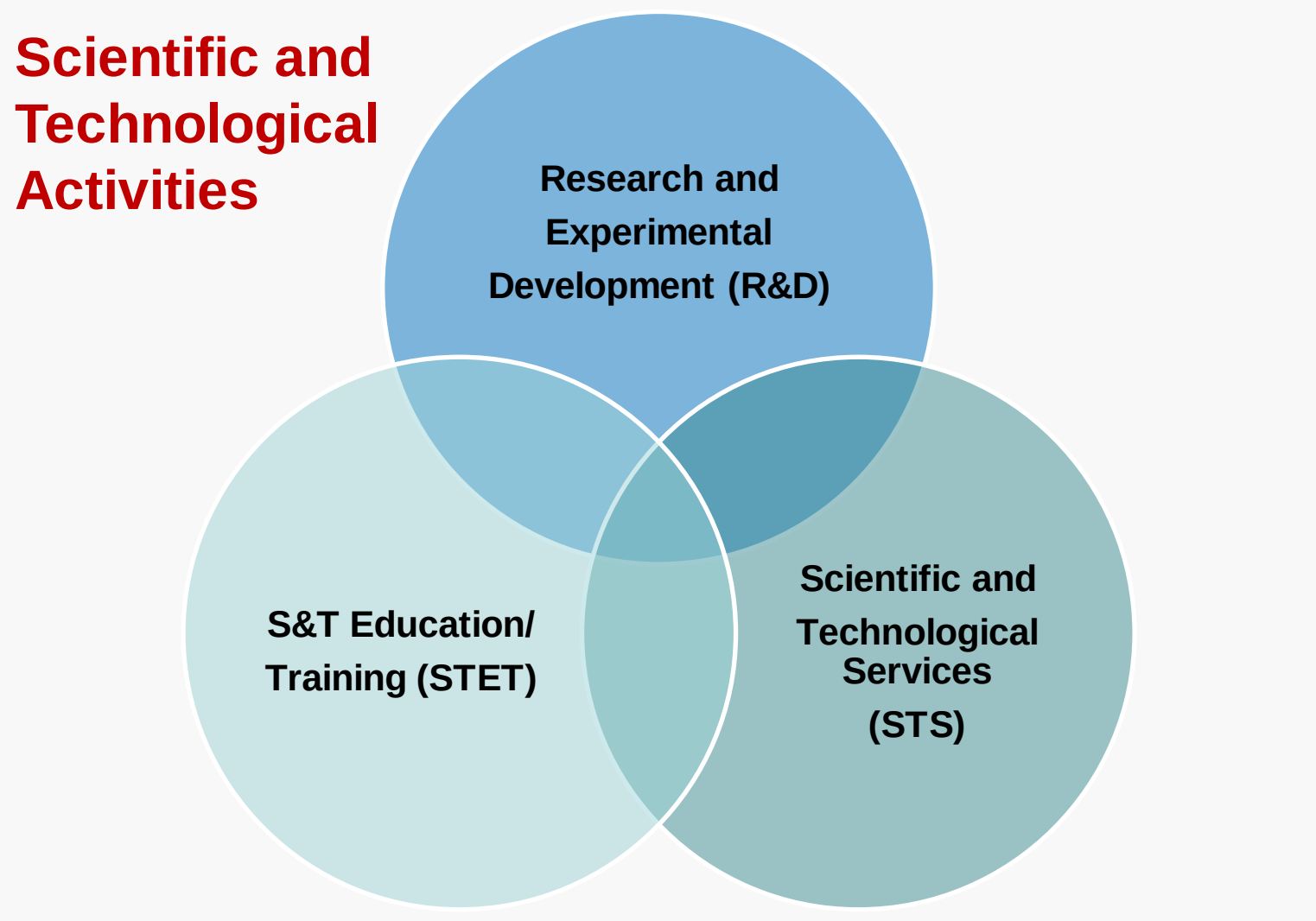
Scientific and Technological Activities (STA) - UNESCO

Scientific and Technological Activities (STA) as those systematic activities which are closely concerned with:

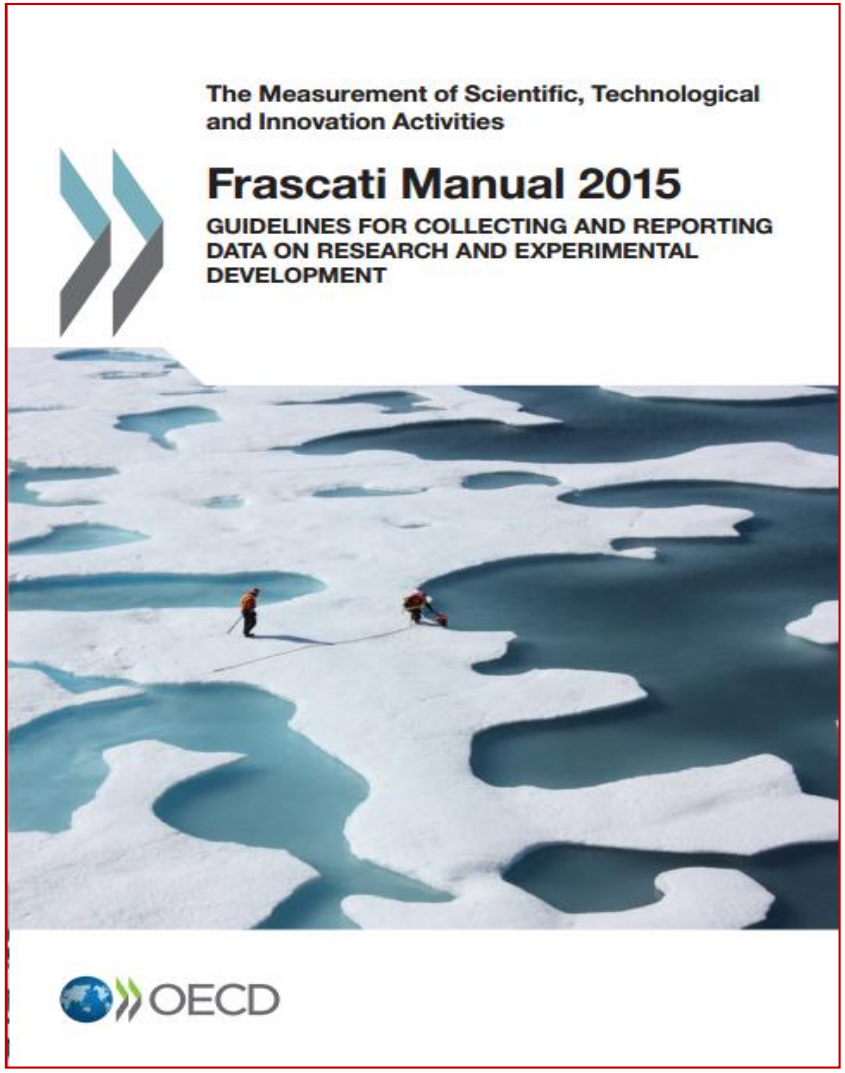
- ***Generation,***
- ***Advancement,***
- ***Dissemination,***
- ***and application of***

scientific and technical knowledge in all fields of science and technology.

Scientific and Technological Activities (STA) - UNESCO



Research and Development (R&D) - OECD



R&D definition proposed by the Frascati Manual has become a standard used in countries' :

- *Science and technology policies*
- *Economic development policies*
- *Tax policies and legislation etc.*

De facto R&D reference document

Research and Development (R&D)

Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge –including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

The term R&D covers three types of activity:

✓ **Basic research**

(Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, ***without any particular application or use in view****.)*

✓ **Applied research**

(Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective.)

✓ **Experimental development**

(Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.)

Research and Development (R&D)

For an activity to be an R&D activity, it must satisfy five core criteria:

- ***Novel*** *(copy, imitate or reverse engineer are not includes novelty.)*
- ***Creative*** *(routine change to products or processes should be excluded)*
- ***Uncertain*** *(in terms of quantity of time and resources needed to achieve it)*
- ***Systematic*** *(should be planned and budgeted)*
- ***Transferable and/or reproducible*** *(It should ensure the use of new knowledge and allow other researchers to reproduce results as part of their R&D activities)*

Purpose

For all R&D activities carried out in the reference period within the borders of the country;

- R&D expenditure
- Human resource used for R&D activity,
- R&D Financing

compilation and publication of information.

Intersection of performing and funding R&D

	R&D performance within the unit	R&D performance outside the unit
Internal sources of funds	(i) Intramural R&D performed with internal funds	(iii) Funding extramural R&D performance using internal funds
External sources of funds	(ii) Intramural R&D performed with external funds	(iv) Funding extramural R&D performance using external funds

Expenditures on intramural R&D represent the amount of money spent on R&D that is performed within a reporting unit (i,ii)

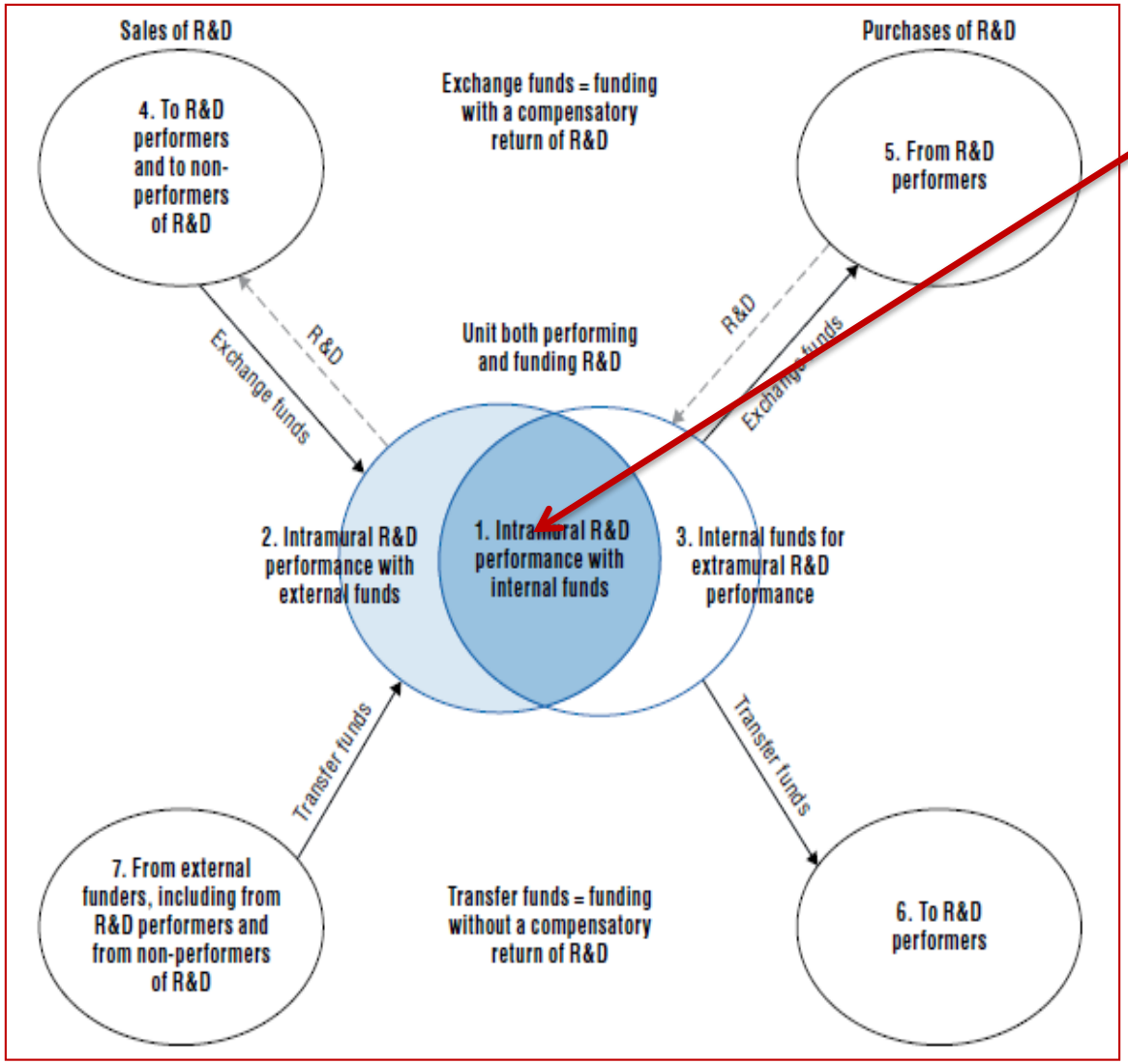
The aggregation of intramural R&D for all units within a sector is synonymous with the performance of R&D within a sector of the economy.

The summation of intramural R&D for all sectors is synonymous with the performance of R&D for the entire economy (GERD).

GERD Matrix

Funding sector	Performing sector				
	Business enterprise sector	Government sector	Higher education sector	Private non-profit sector (PNP)	TOTAL
Business enterprise sector	X	X	X	X	X
Government sector	X	X	X	X	X
Higher education sector	X	X	X	X	X
Private non-profit sector (PNP)	X	X	X	X	X
Rest of the world • *Business enterprise sector* • *Government sector* • *Higher education sector* • *Private non-profit sector* • *EU Institutions* • *International organisations (FAO, OECD etc.)*	X	X	X	X	X
TOTAL	X	X	X	X	X

Funding flows from the perspective of an R&D performer



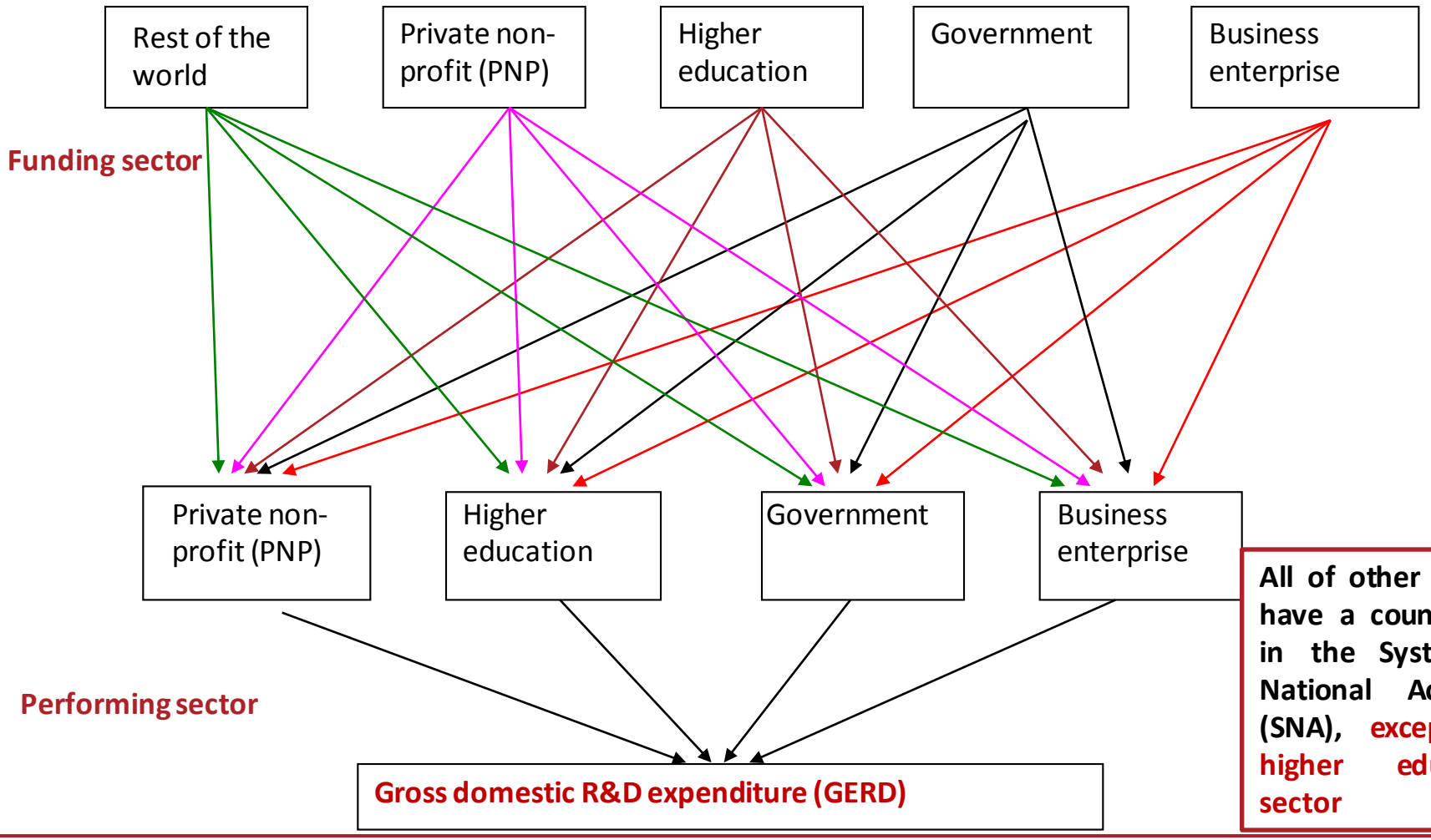
While calculating the intramural R&D activity, sections one and two in the circle are taken into account.

Internal R&D funds are the amount of money spent on R&D that originate within the control of a reporting unit.
External R&D funds are the amount of money spent on R&D that originates outside the control of a reporting unit.
"External R&D funds" divides into two groups. These are R&D transfer funds and R&D exchange funds.

R&D transfer funds are funding flows from one statistical unit to another statistical unit to perform R&D that does not require any good or service in return and where the funder is not entitled to any significant rights on the outcome of the R&D it has funded.

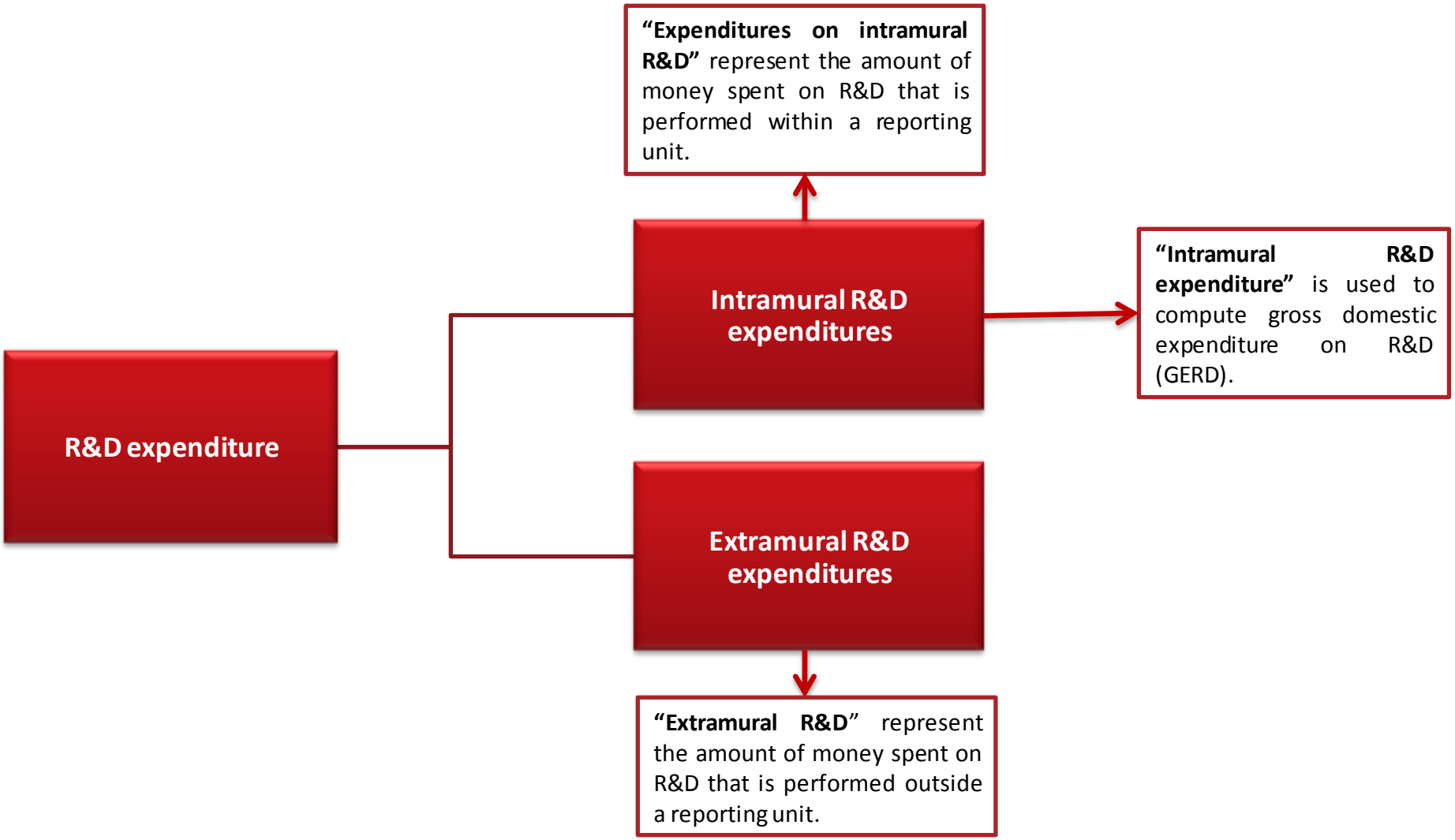
R&D exchange funds are funding flows from one statistical unit to another statistical unit in return for the performance of R&D and the delivery of relevant R&D outcomes.

Measurement of R&D expenditures: Performance and sources of funds

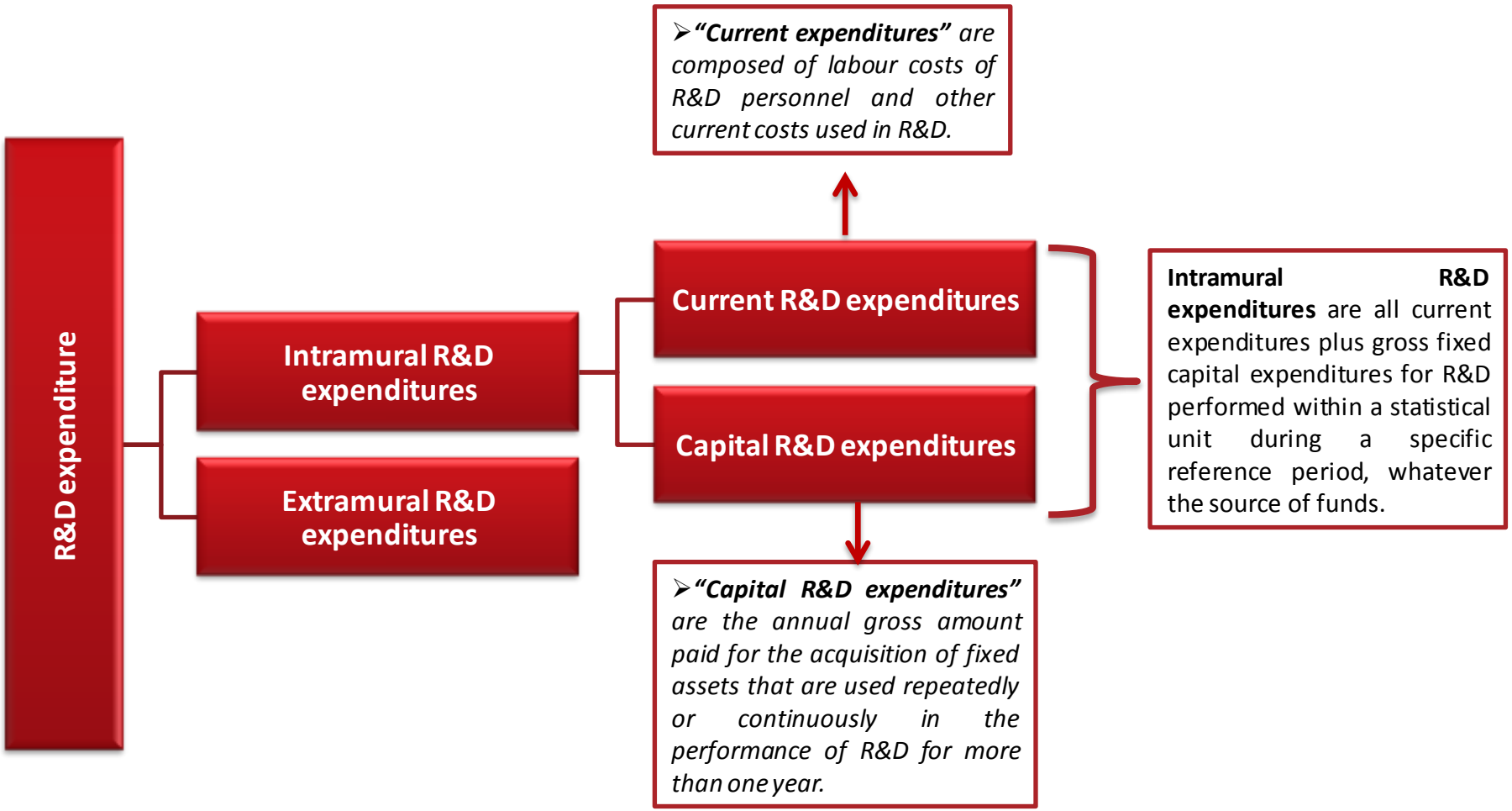


All of other sectors have a counterpart in the System of National Accounts (SNA), except the higher education sector

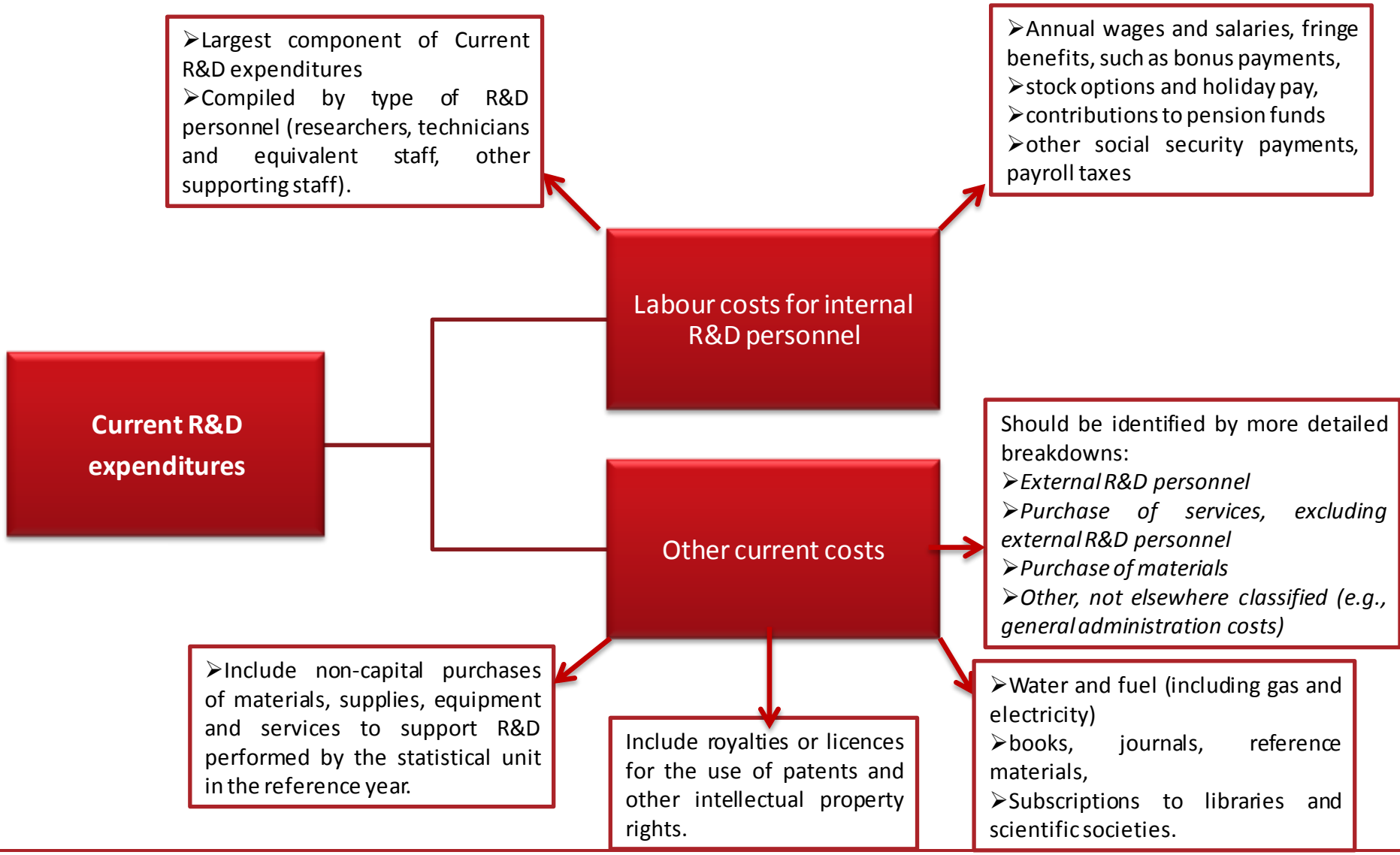
Summary of R&D expenditure categories



Summary of intramural R&D expenditure categories



Summary of R&D expenditure categories



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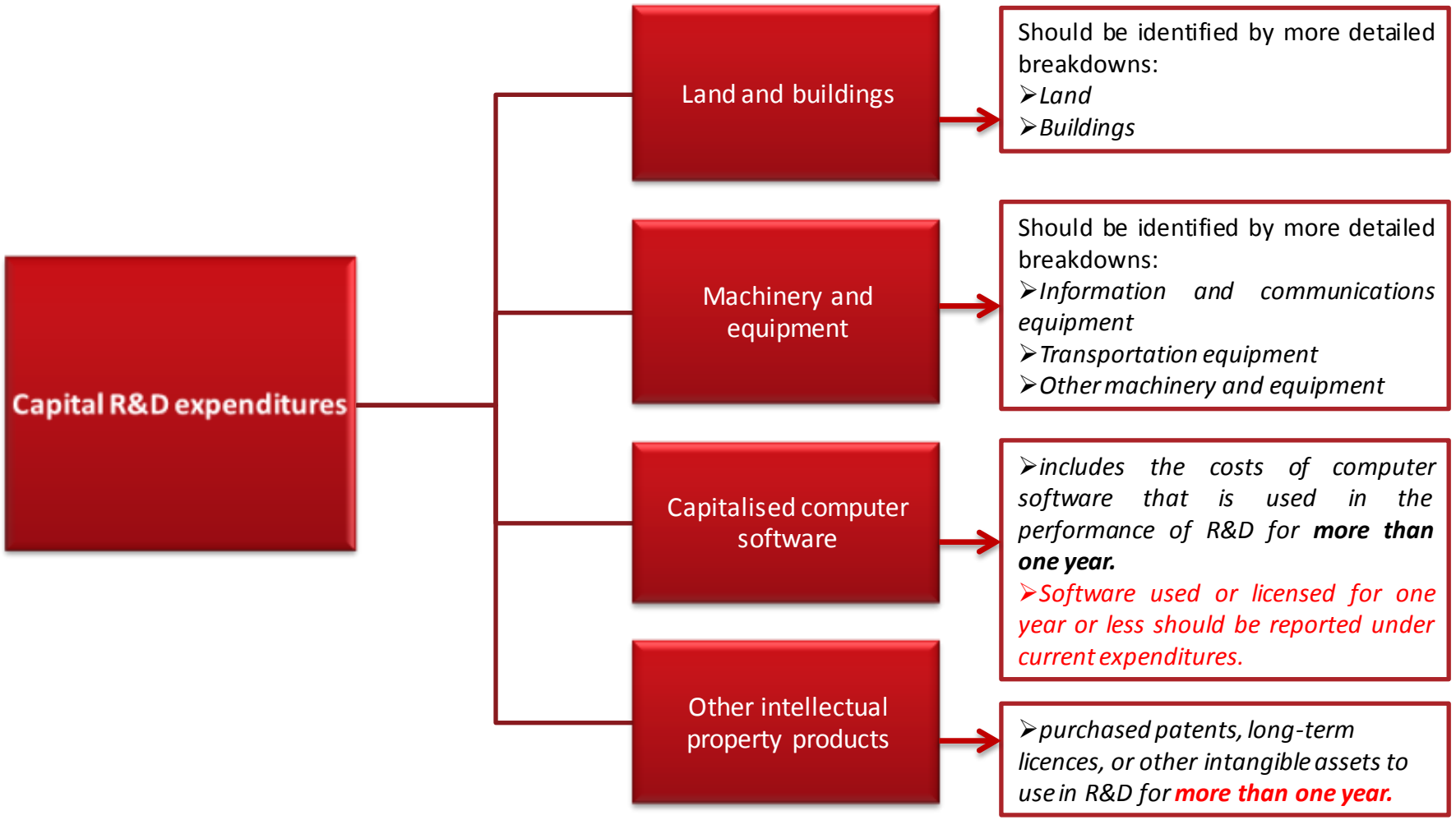
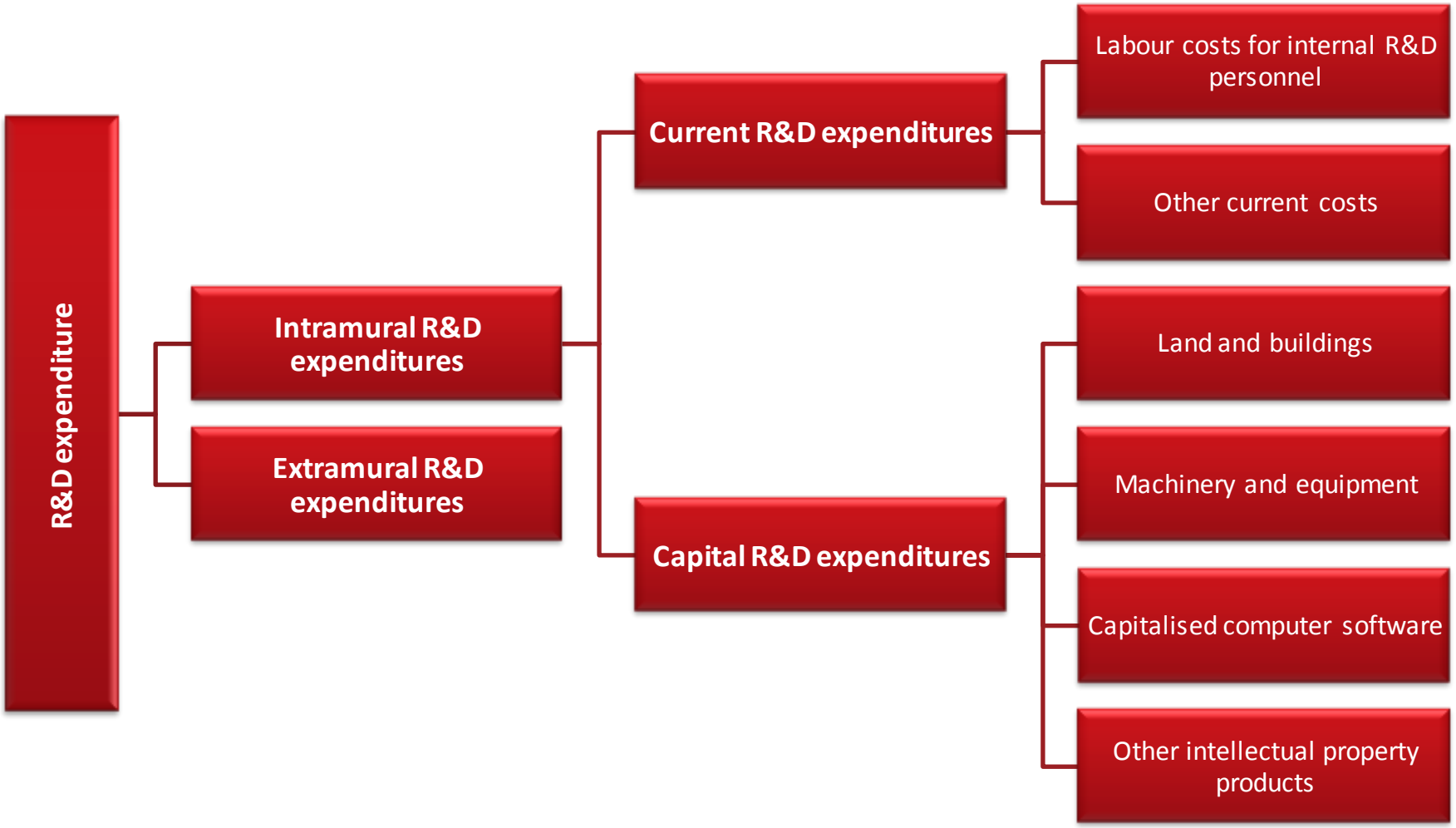
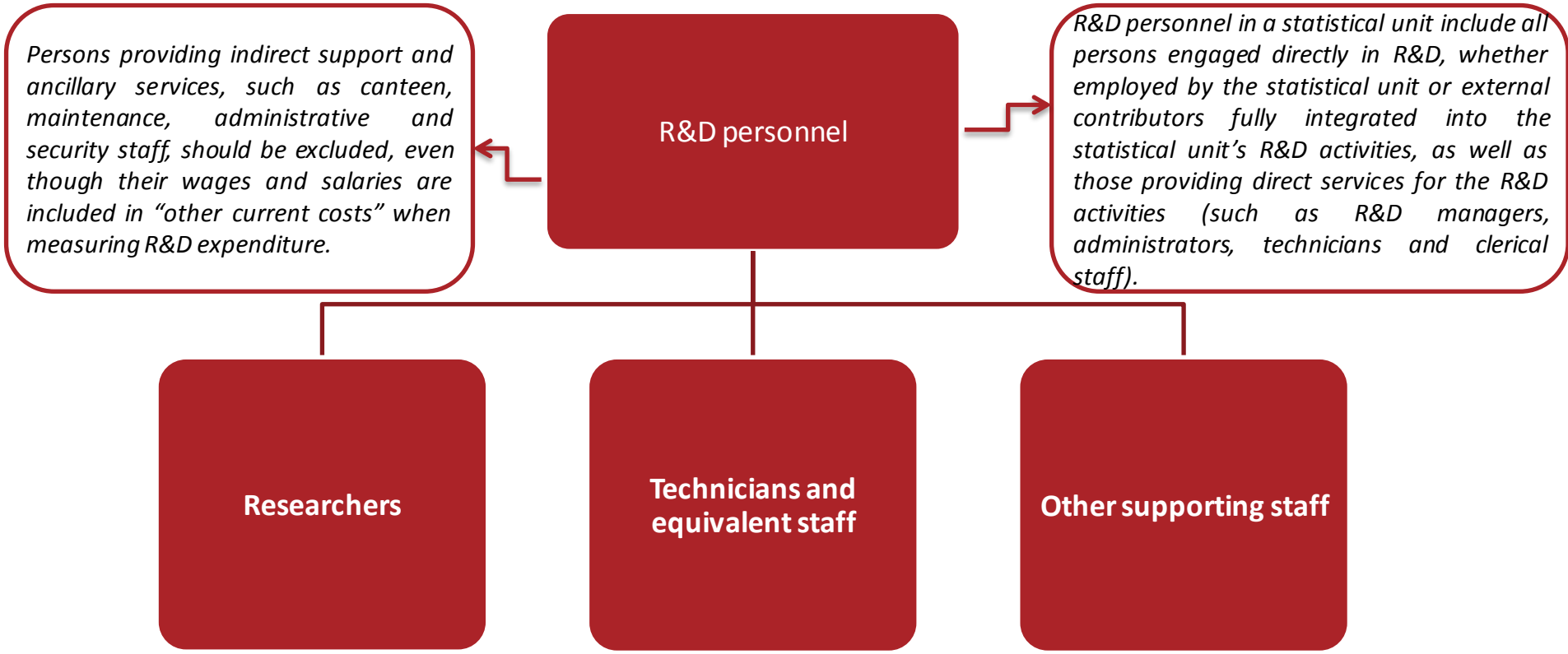


Summary of intramural R&D expenditure categories



R&D personnel by function



Researchers Personnel

Researchers tasks

- *Conducting research, experiments, tests and analyses*
- *Developing concepts, theories, models, techniques, instrumentation, software and operational methods*
- *Gathering, processing, evaluating, analysing, and interpreting research data*
- *Evaluating the results of investigations and experiments and positing conclusions using different techniques and models*
- *Applying principles, techniques and processes to develop or improve practical applications*
- *Advising on designing, planning and organising the testing, construction, installation and maintenance of structures, machines, systems and their components*
- *Providing advice and support to governments, organisations and businesses on the application of research results*
- *Planning, directing and coordinating the R&D activities of institutions that provide related services to other organisations*
- *Preparing scientific papers and reports.*

Technicians and equivalent and Other supporting staff tasks

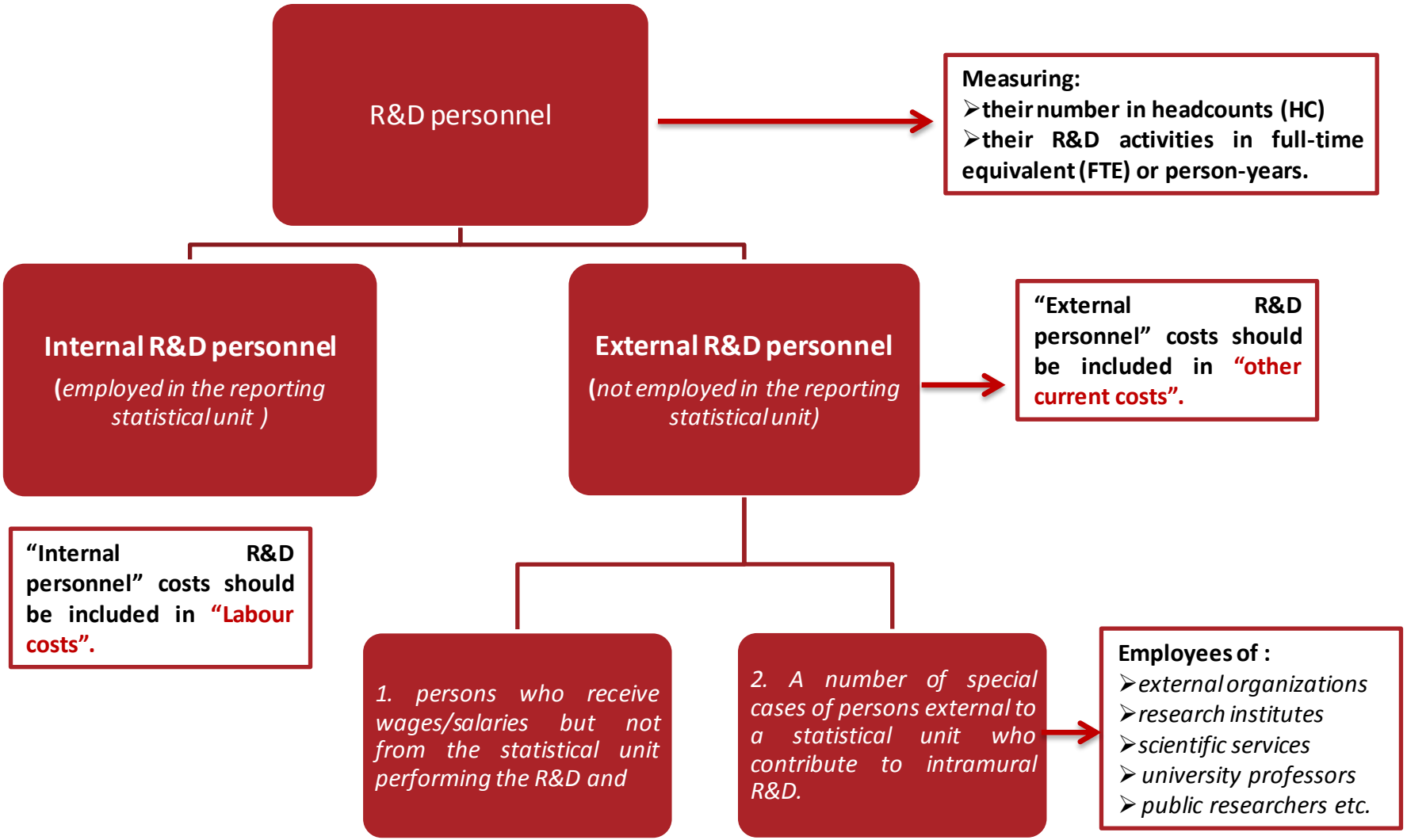
Technicians and equivalent staff:

- *Carrying out bibliographic searches and selecting relevant material from archives and libraries*
- *Preparing computer programs*
- *Carrying out experiments, tests and analyses*
- *Providing technical assistance and support in R&D, or testing prototypes*
- *Operating, maintaining and repairing research equipment*
- *Preparing materials and equipment for experiments, tests and analyses*
- *Recording measurements, making calculations and preparing charts and graphs*
- *Collecting information using accepted scientific methods*
- *Assisting in analysing data, keeping records and preparing reports*
- *Carrying out statistical surveys and interviews.*

Other supporting staff :

- *Skilled and unskilled craftsmen*
- *Administrative, secretarial and clerical staff*

Persons employed and external contributors



Head Count (HC) vs. Full-Time Equivalent (FTE)

HC

- *Data on the total number of persons who are mainly or partially employed on R&D*
- *Allow links to be made with other data series, for example education or employment data or the results of population censuses.*
- *Most appropriate measure for collecting additional information about R&D personnel, such as age, gender or national origin.*
- *should be distributed notably by sex, function, employment status, age and formal qualification*
- *If it is possible, it can be distributed by seniority level, geographic origin and personnel as well*

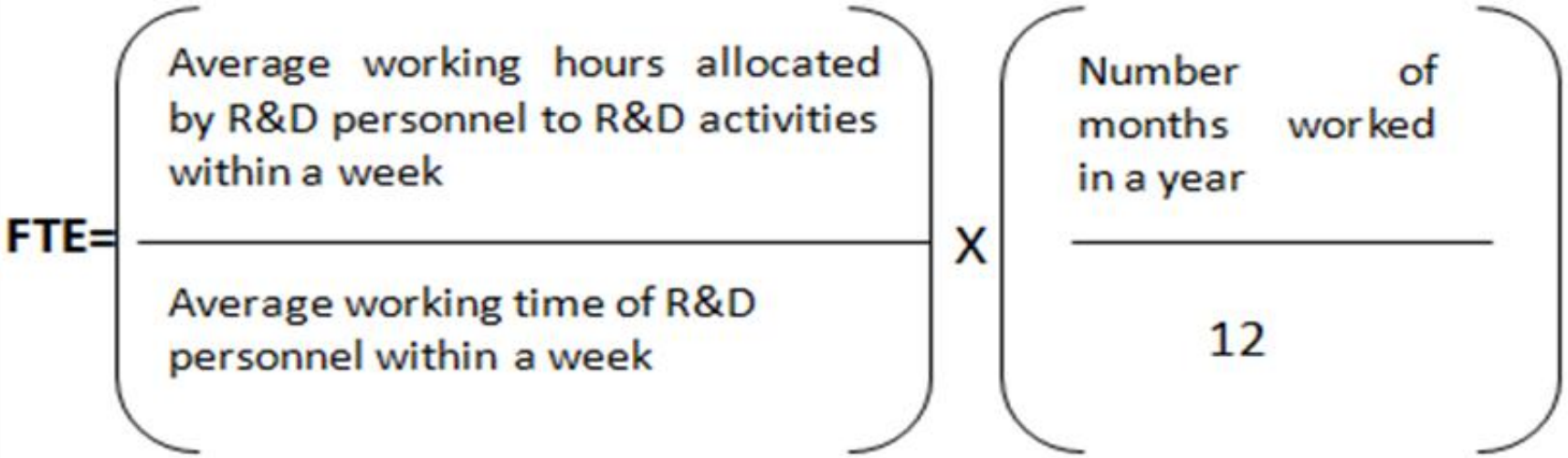
FTE

- *True measure of the volume of R&D: To count only persons whose primary function is R&D would result in an underestimate of the effort devoted to R&D; to do a headcount of everyone spending some time on R&D would lead to an overestimate.*
- *One FTE may be thought of as one person-year.*
- *Should be distributed notably by sex, function, employment status, age and formal qualification*
- *If it is possible, it can be distributed by seniority level, geographic origin and personnel as well*

Full-time equivalent (FTE) formula to R&D personnel

The Full-time equivalent (FTE) of R&D personnel is defined as the ratio of working hours actually spent on R&D during a specific reference period divided by the total number of hours conventionally worked in the same period by an individual or by a group.

Full-time equivalent <= headcount	0 < Full-time equivalent <= 1



Full-time equivalent (FTE) of R&D personnel

The following examples indicate how the formula could be used in the calculation of FTE totals:

1. a full-time employee spending 100% of time on R&D during a year ?

→ **(1 x 1 x 1) = 1 FTE**

2. a full-time employee spending 30% of time on R&D during a year ?

→ **(1 x 1 x 0.3) = 0.3 FTE**

3. a full-time R&D person spending 100% of time on R&D employed at an R&D institution only for six months ?

→ **(1 x 0.5 x 1) = 0.5 FTE**

4. a full-time employee spending 40% of time on R&D during half of the year (the person is only active for 6 months per year) ?

→ **(1 x 0.5 x 0.4) = 0.2 FTE**

5. a part-time employee (working 40% of a full-time year) engaged only in R&D (spending 100% of time on R&D) during a year ?

→ **(1 x 1 x 0.4) = 0.4 FTE**

6. a part-time employee (working 40% of a full-time year) spending 60% of time on R&D during half of the year (person is only active for 6 months per year) ?

→ **(0.5 x 0.6 x 0.4) = 0.12 FTE**

FTE (Specific problems in the higher education sector)

There are two interrelated problems for measurement of R&D personnel:

- *Definition of the working time.*
- *Calculation of full-time equivalence.*

Characteristics of working time of an academic teacher/researcher

Teaching hours usually well-defined, but absolute working time varies:

- Number of teaching hours per week
- Demands made by examinations and student supervision
- Administrative duties
- Nature of R&D activities and deadlines imposed
- Student vacation periods

much of their professional activity – notably R&D – is carried out outside "normal working hours".

FTE (Specific problems in the higher education sector)

Time-Use Surveys

Question 1: Census or sample ?

- Census cannot be recommended for all countries
- Sample should be representative of the categories and stratified by FORD

Question 2: Reporting unit ?

- The preferred reporting unit individual researcher,
- not the university administration.

Question 3: Type of activities ?

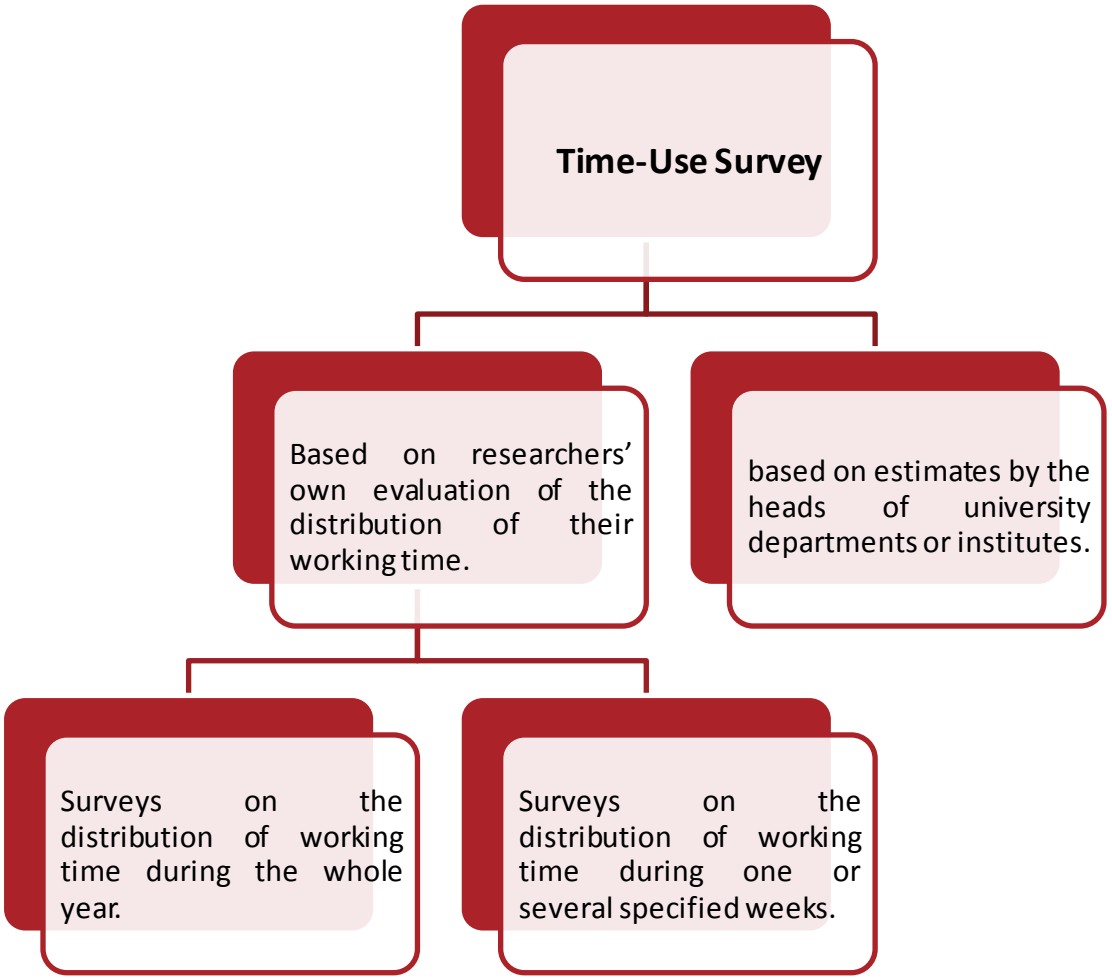
- R&D,
- Teaching.
- Other work

Question 4: Period of time?

- All typical periods within one year should be covered.

Question 4: Frequency ?

- Desirable for the surveys to be regular
- Interval between two surveys should, if possible, not exceed five years.



Time-Use Survey Example in Turkey

History: *Conducted in 2015 (reference year 2014) (the previous one conducted in 2005)*

Frame: *Higher Education Council Academic Personnel Database*

Sampling: *Stratified by academic title (5 categories) and FoS (6 categories)*

Sample size: *15.980 (14% of target population)*

Survey type: *Stand-alone web survey*

Reporting unit: *Individual researcher*

Time-Use Survey Example in Turkey

Time proportion:

- *R&D*
- *Teaching for graduate level*
- *Teaching for postgraduate / doctorate level*
- *Supervision of students*
- *Administration*
- *Other work*

Period of time: One typical week during the lecture period and another week in the lecture-free period

Recommended distribution of R&D personnel (HC/FTE)

- **R&D personnel by sex**
  - *Female*
  - *Male*
- **R&D personnel by R&D function**
  - *Researchers,*
  - *Technicians and equivalent staff,*
  - *Other supporting staff.*
- **R&D personnel by employment status**
  - *Internal R&D personnel,*
  - *External R&D personnel*
- **R&D personnel by age**
  - *under 25 years*
  - *25-34 years*
  - *5-44 years*
  - *45-54 years*
  - *55-64 years*
  - *65 years and more.*
- **R&D personnel and researchers by formal qualification**
  - *Holders of university degrees at doctoral or equivalent level (ISCED level 8).*
  - *Holders of university degrees at master's or equivalent level (ISCED level 7).*
  - *Holders of university degrees at bachelor's or equivalent level (ISCED level 6).*
  - *Holders of other tertiary level diplomas (ISCED level 5).*
  - *Holders of post-secondary non-tertiary diplomas (ISCED level 4).*
  - *Holders of diplomas of upper secondary education (ISCED level 3).*
  - *Other qualifications (below ISCED level 3 or with education not falling under any of the other six classes*
- **R&D personnel by seniority level.**
- **R&D personnel by geographic origin**
- **R&D personnel flows**

Notably

If possible

Borderline between R&D and other activities

Item	Include in R&D	Not include in R&D
Prototypes	*As long as the primary objective is to make further improvements.*	*Several copies of a prototype*
Pilot plants	*As long as the primary purpose is R&D.*	*As soon as this experimental phase is over, a pilot plant switches to operating as a normal commercial production unit*
Trial production	*if production implies full-scale testing and subsequent further design and engineering.*	*Exclude all other associated activities*
Pre-production development		*to be excluded from R&D*
After-sales service and trouble shooting	*if "feedback" R&D (to be included).*	*Exclude Except "feedback" R&D (to be included).*
Patent and licenses work	*All administrative and legal work needed to apply for patents and licences (delivering documentation as an outcome of R&D projects is R&D).* *Patent work connected directly with R&D projects is R&D.*	*Not connected directly with R&D projects is not R&D.*
Routine tests		*Exclude (Even if undertaken by R&D personnel.)*
General purpose data collection		*to be excluded from R&D*
Routine compliance with public inspection control, enforcement of standards, regulations		*to be excluded from R&D*

Borderline between R&D and other activities

Item	Include in R&D	Not include in R&D
Tooling up and industrial engineering	*If the tooling up process results in further R&D work, such as improvements in the production of machinery and tools or changes to the production and quality control procedures or the development of new methods and standards, these activities are classified as R&D.*	*if the tooling up process a part of the production process these activities are not classified as R&D.*
Clinical trial	*For the purposes of international comparison, by convention, clinical trial phases 1, 2 and 3 can be treated as R&D*	*Phase 4 clinical trials, which continue testing the drug or treatment after approval and manufacture, should only be treated as R&D* ***if they bring about a further scientific or technological advance.***
R&D and software development	*•The development of new operating systems or languages* *•The design and implementation of new search engines based on original technologies* *•The effort to resolve conflicts within hardware or software based on the process of re-engineering a system or a network* *•The creation of new or more efficient algorithms based on new techniques* *•The creation of new and original encryption or security techniques.*	*•The development of business application software and information systems using known methods and existing software tools* *•Adding user functionality to existing application programs (including basic data entry functionalities)* *•The creation of websites or software using existing tools* *•The use of standard methods of encryption, security verification and data integrity testing* *•The customization of a product for a particular use, unless during this process knowledge is added that significantly improves the base program* *•Routine debugging of existing systems and programs, unless this is done prior to the end of the experimental development process.*

Borderline between R&D and other activities

Item	Include in R&D	Not include in R&D
R&D and education and training	*•Since the research activity performed by doctoral students should be included in the overall R&D performed by the higher education sector, both they and the university staff acting as their instructors or supervisors should be included in R&D personnel totals*	*•Educational and training institutions below the tertiary level focus their resources on teaching and, as a result, have a very low likelihood of being involved in R&D projects.* *•The time spent by the university staff to undertake tasks that are not related to research should be excluded from the estimation of the actual R&D performance. This applies to all scientific disciplines.* *• All education and training of personnel in the natural sciences, engineering, medicine, agriculture, the social sciences and the humanities and the arts in universities and special institutions of higher education should be excluded from R&D.*
Routine testing and standardisation		*to be excluded from R&D*
Production and related technical activities		*to be excluded from R&D*
Feasibility studies		*to be excluded from R&D*
Scientific and technical information services		*to be excluded from R&D*
Policy-related studies		*to be excluded from R&D*
Purely R&D-financing activities		*to be excluded from R&D*
Indirect supporting activities		*to be excluded from R&D*
Programmatic evaluations		*to be excluded from R&D*

Classifications

Structure of NACE Rev. 2

Section	Title	Divisions
A	Agriculture, forestry and fishing	01 – 03
B	Mining and quarrying	05 – 09
C	Manufacturing	10 – 33
D	Electricity, gas, steam and air conditioning supply	35
E	Water supply; sewerage, waste management and remediation activities	36 – 39
F	Construction	41 – 43
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45 – 47
H	Transportation and storage	49 – 53
I	Accommodation and food service activities	55 – 56
J	Information and communication	58 – 63
K	Financial and insurance activities	64 – 66
L	Real estate activities	68
M	Professional, scientific and technical activities	69 – 75
N	Administrative and support service activities	77 – 82
O	Public administration and defence; compulsory social security	84
P	Education	85
Q	Human health and social work activities	86 – 88
R	Arts, entertainment and recreation	90 – 93
S	Other service activities	94 – 96
T	Activities of households as employers; undifferentiate goods- and services-producing activities of households for own use	97 – 98
U	Activities of extraterritorial organisations and bodies	99

Classification of NABS

01	Exploration and exploitation of the earth	
02	Environment	
03	Exploration and exploitation of space	
04	Transport, telecommunication and other infrastructures	
05	Energy	
06	Industrial production and technology	
07	Health	
08	Agriculture	
09	Education	
10	Culture, recreation, religion and mass media	
11	Political and social systems, structures and processes	
12	General advancement of knowledge: R&D financed from general university funds (GUF)	12.1 R&D related to Natural Sciences
		12.2 R&D related to Engineering Sciences
		12.3 R&D related to Medical Sciences
		12.4 R&D related to Agricultural Sciences
		12.5 R&D related to Social Sciences
		12.6 R&D related to Humanities
13	General advancement of knowledge: R&D financed from other sources than GUF	13.1 R&D related to Natural Sciences
		13.2 R&D related to Engineering Sciences
		13.3 R&D related to Medical Sciences
		13.4 R&D related to Agricultural Sciences
		13.5 R&D related to Social Sciences
		13.6 R&D related to Humanities
14	Defence	

R&D personnel by International Standard Classification of Education (ISCED)

Holders of	Sector				
Tertiary degrees	Business enterprise sector	Government sector	Higher education sector	Private non-profit sector (PNP)	TOTAL
Doctoral or equivalent (ISCED 8)	X	X	X	X	X
Master's or equivalent (ISCED 7)	X	X	X	X	X
Bachelor's or equivalent (ISCED 6)	X	X	X	X	X
Other tertiary level diplomas (ISCED 5)	X	X	X	X	X
Other degrees (ISCED 1 to 4)	X	X	X	X	X
TOTAL	X	X	X	X	X

Fields of R&D classification (FORD)

1	Natural sciences	
	1.1	Mathematics
	1.2	Computer and information sciences
	1.3	Physical sciences
	1.4	Chemical sciences
	1.5	Earth and related environmental sciences
	1.6	Biological sciences
	1.7	Other natural sciences
2	Engineering and technology	
	2.1	Civil engineering
	2.2	Electrical engineering, electronic engineering, information engineering
	2.3	Mechanical engineering
	2.4	Chemical engineering
	2.5	Materials engineering
	2.6	Medical engineering
	2.7	Environmental engineering
	2.8	Environmental biotechnology
	2.9	Industrial biotechnology
	2.10	Nano-technology
	2.11	Other engineering and technologies
3	Medical and health sciences	
	3.1	Basic medicine
	3.2	Clinical medicine
	3.3	Health sciences
	3.4	Medical biotechnology
	3.5	Other medical science
4	Agricultural and veterinary sciences	
	4.1	Agriculture, forestry, and fisheries
	4.2	Animal and dairy science
	4.3	Veterinary science
	4.4	Agricultural biotechnology
	4.5	Other agricultural sciences
5	Social sciences	
	5.1	Psychology and cognitive sciences
	5.2	Economics and business
	5.3	Education
	5.4	Sociology
	5.5	Law
	5.6	Political science
	5.7	Social and economic geography
	5.8	Media and communications
	5.9	Other social sciences
6	Humanities and the arts	
	6.1	History and archaeology
	6.2	Languages and literature
	6.3	Philosophy, ethics and religion
	6.4	Arts (arts, history of arts, performing arts, music)
	6.5	Other humanities

Coverage and statistical units

Why sectoring?

- *Different questionnaires and survey methods can be used for each sector*
- *When measuring R&D expenditure and personnel, the sectoral approach offers a reliable approach for building up national aggregates.*
- *Sectoring offers a framework for analyzing the flows of funds between R&D funding and R&D-performing entities*
- *Aggregation into sectors also helps avoid the problem posed by the often confidential nature of R&D data collected under statistical secrecy rules.*
- *It is acknowledged that a single classification scheme may not be sufficient on its own to accomplish each one of these multiple purposes or to meet the varied and increasing range of user interests in R&D statistics.*

Coverage for Business Enterprises Sector

Coverage:

1. **All resident financial and non-financial corporations, including not only legally incorporated enterprises, regardless of the residence of their shareholders.**
2. **All resident non-profit institutions (NPIs) mainly serving business.**

✓ *engaged in market production (Research institutes, clinics, hospitals, medical practitioners in private, fee-paying practices, etc.)*

✓ *serving business (they are designed to promote, such as chambers of commerce and agricultural, manufacturing or trade associations)*

3. **Government-controlled enterprises (public enterprises) (**Business organizations wholly or partly owned by the state and controlled through a public authority. Utilities (gas, electricity, etc.), broadcasting, telecommunications, and certain forms of transport are examples of this kind of public enterprise.
4. **Private enterprises producing higher education services should be included in the higher education sector**

Size classes of Business Enterprises Sector (BES)

Size classes:

- *Micro (1-9)*
- *Small: 10-49*
- *Medium: 50-249*
- *Large: 250 and above*

Framework for Business Enterprises

Framework example for Business Enterprises Sector in Turkey:

- *Enterprises which are known as R&D performers from previous surveys (R&D, Innovation and Structural Business Surveys)*
- *Enterprises supported directly by Government Institutions (Including all enterprises applied grant whether or not the project granted)*
- *Enterprises supported indirectly via tax incentives or R&D deductions under the Law on Supporting Research and Development*
- *Enterprises in Technology Development Zones and Technoparks*
- *Top 500 enterprises in industry and services sector separated by turnover and value added. Etc.*

Coverage for GOV and PNP institutions

Target population:

1. **All Government units :**

- *Central (federal),*
- *Regional (state)*
- *Municipal (local) government, including social security funds*

2. **Non-profit institutions (NPIs) that are non-market producers and are controlled by a government unit,**

3. **Public institutions dealing with STS: statistical, meteorological, geological and other public services, museums, hospitals.**

4. Government-controlled enterprises **are excluded from the Government sector**

5. All Public higher education institutions **are excluded from the Government sector**

Coverage for Higher education

Target population

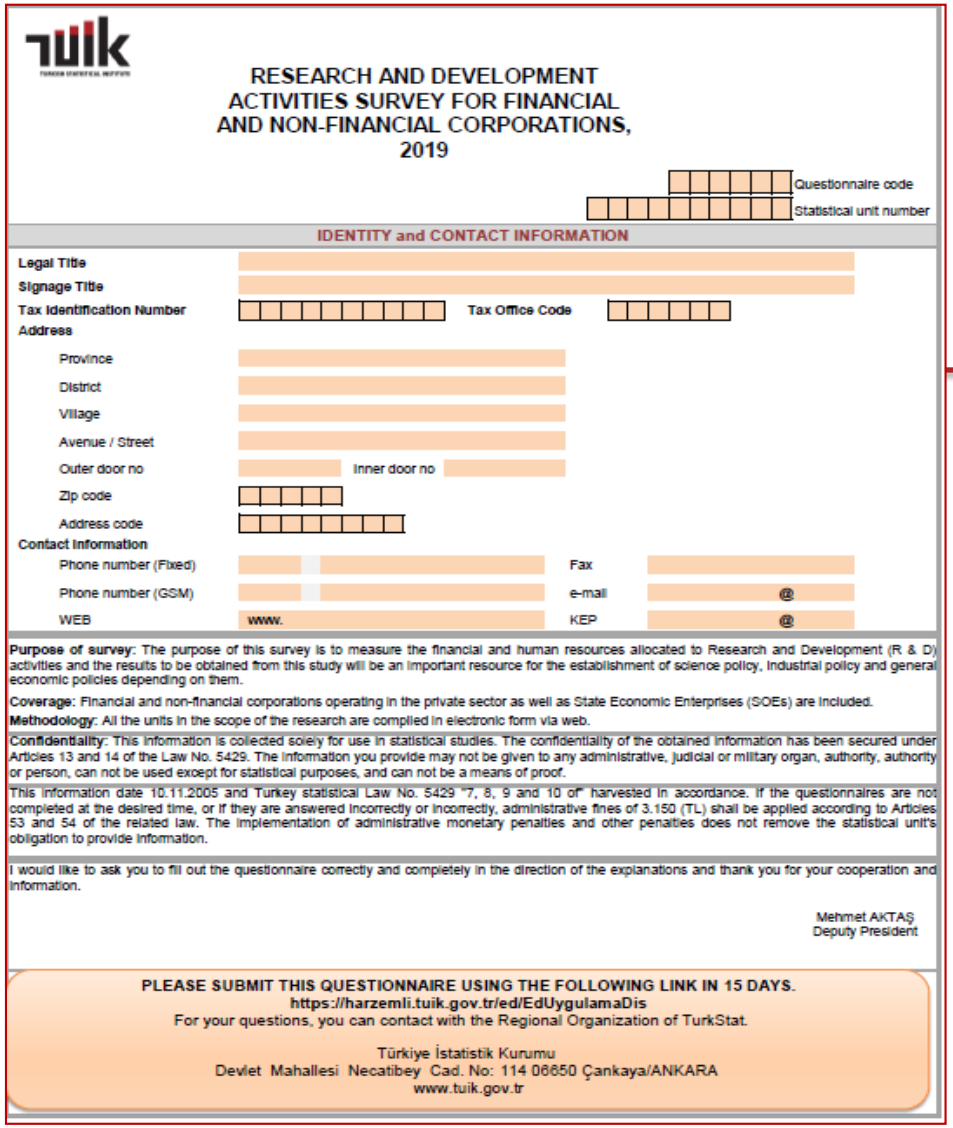
1. All universities, colleges of technology and other institutions providing formal tertiary education programmes, whatever their source of finance or legal status.

2. All research institutes, centres, experimental stations and clinics that have their R&D activities under the direct control of, or administered by, tertiary education institutions.

3. Need time-use surveys and other methods of estimating shares of R&D - R&D coefficients- in total activities in the higher education sector

Survey design example in Turkey

Bes-Questionnaire



RESEARCH AND DEVELOPMENT ACTIVITIES SURVEY FOR FINANCIAL AND NON-FINANCIAL CORPORATIONS, 2019

Questionnaire code

Statistical unit number

IDENTITY and CONTACT INFORMATION

Legal Title

Signage Title

Tax Identification Number

Tax Office Code

Address

Province

District

Village

Avenue / Street

Outer door no

Inner door no

Zip code

Address code

Contact information

Phone number (Fixed)

Fax

Phone number (GSM)

e-mail

WEB www.

KEP

Purpose of survey: The purpose of this survey is to measure the financial and human resources allocated to Research and Development (R & D) activities and the results to be obtained from this study will be an important resource for the establishment of science policy, industrial policy and general economic policies depending on them.

Coverage: Financial and non-financial corporations operating in the private sector as well as State Economic Enterprises (SOEs) are included.

Methodology: All the units in the scope of the research are compiled in electronic form via web.

Confidentiality: This information is collected solely for use in statistical studies. The confidentiality of the obtained information has been secured under Articles 13 and 14 of the Law No. 5429. The information you provide may not be given to any administrative, judicial or military organ, authority, authority or person, can not be used except for statistical purposes, and can not be a means of proof.

This information date 10.11.2005 and Turkey statistical Law No. 5429 "7, 8, 9 and 10 of" harvested in accordance. If the questionnaires are not completed at the desired time, or if they are answered incorrectly or incorrectly, administrative fines of 3.150 (TL) shall be applied according to Articles 53 and 54 of the related law. The implementation of administrative monetary penalties and other penalties does not remove the statistical unit's obligation to provide information.

I would like to ask you to fill out the questionnaire correctly and completely in the direction of the explanations and thank you for your cooperation and information.

Mehmet AKTAŞ
Deputy President

PLEASE SUBMIT THIS QUESTIONNAIRE USING THE FOLLOWING LINK IN 15 DAYS.
https://harzemli.tuik.gov.tr/ed/EdUygulamaDis
For your questions, you can contact with the Regional Organization of TurkStat.

Türkiye İstatistik Kurumu
Devlet Mahallesi Necatibey Cad. No: 114 06650 Çankaya/ANKARA
www.tuik.gov.tr

Paper based questionnaire is prepared only for internal usage

Bes-Questionnaire

INSTRUCTIONS for QUESTIONNAIRE

DEFINITONS AND EXPLANATIONS

Enterprise: The enterprise is an organizational form that produces goods and services using decision autonomy at first degree. An enterprise carries out one or more activities at one or more locations. The relation between enterprise and legal unit is directly stated by this definition. An enterprise corresponds to a legal unit or combination of legal units. This questionnaire; if the enterprise has a unit operating under more than one account under the same tax identification number, it must be filled out at the enterprise center to cover all the units' information.

Local unit: A unit that carries out some or all of its activities related to goods and services in a geographically defined place. The local unit is the department established in a geographically identifiable address such as an office, a shop, a kiosk, a factory, a workshop, a mine, a building site, a hotel, a restaurant, a café, a school, a hospital, The local unit is the place where one or more people conduct their full-time or part-time economic activity for their own enterprise. The place where the center of the enterprise is located and the units that carry out the auxiliary activities are the local units.

Research and development: Research and experimental development comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

Following examples of sectors that have difficulty in finding R&D activities. Examples and other information on R&D activities and activities to be excluded from R&D can be found as follows:

Five criteria for the definition of R&D: The five main criteria for the identification of R&D projects as well as specific R&D projects are given as follows:

1) Novel: The activity has not been used in the market to be defined as R & D and it needs to contain new findings for the sector. Copied, imitated, reverse engineering and information-gathering activities are not covered by R & D. Experimental development projects aiming at the development of new concepts and ideas related to the design of new products or processes are in the scope of R & D. For example, the documentation of a systematic test of a chemical reaction that allows a molecule that can not be produced in the scientific literature to be obtained is also considered as R&D.
2) Creative: An R & D project aims to produce new definitions and ideas for the development of existing knowledge. The human factor for this production should be the front panel. The presence of research personnel in a project with other criteria is an important factor in achieving this criterion.
3) Uncertain: In general, expenditure, time, etc. required to achieve expected results in R & D activities. the elements are unknown. In some cases, the desired results can be achieved in a shorter period of time or at a lower cost.
4) Systematic: Items related to targets, finance and human resources aiming to meet the specific needs of the project with R & D are recorded.
5) Transferable and/or reproducible: An R&D project should allow for new information transfer and its results to be used by other researchers in their projects. The results obtained may be negative or unattainable, but the aim is to increase the available knowledge of R&D.

Examples of R & D activities according to R & D scope and sectors

What is R&D?	What is not R&D?
- Development of Internet technology - Industrial design for R&D project - Industrial engineering in prototype development for new or improved products - Software development including innovation	- Routine testing and standardisation - Production and related technical activities - Patent and licence work - Feasibility studies - Scientific and technical information services - Routine software development - General purpose data collection

Examples of software development:

In order for a software development activity to be termed R & D, its completion must be related to a scientific and / or technological progress and to ensure systematic resolution of scientific and / or technological uncertainty for the purpose of the project. Below are some examples of R & D activities in the field of software.

- The development of new programming systems or languages,
- A new search engine design and implementation
- The solution of hardware or software problems used in a network, system or re-engineering process,
- The creation of new or more efficient algorithms with new techniques,
- Creation of a new and original coding or security method.

Software examples that out of scope

- The development of a business software and information system with existing equipment and known methods,
- The addition of user function to existing application ,
- Preparing website or software with existing tools,
- The use of standard applications for coding, security verification and data integrity testing

In service companies, R&D may not always be formally organized (as in the case of the presence of a separate R&D department, researchers or research engineers on the institution's personnel list)

Definitions and examples from FM (3 pages)

All definitions and examples are added on web-questionnaire

Bes-Questionnaire

1. Is your unit that operate at this address, enterprise centre?

Yes 1 No 2 → Please inform your interviewer to convey this questionnaire to the enterprise center.

2. Is your enterprise part of a corporate group (holding company,company union etc.)?

Yes 1 No 2 → Go to question 3

2.1. Please indicate the country where the center of the group name and group.

Name of Group CODE

Country (Do not fill the code area)

3. Capital distribution of your enterprise

	(%)
1. Domestic capital	
2. Foreign capital	
Total	100

4. Did your enterprise carry out intramural R&D activities in 2019?

(Definitions regarding R&D is clarified in Instructions section.)

Yes 1 No 2 → Go to question 13

5.1 Field of R&D related to your intramural R&D activities carried out in 2019

(Please fill the table according to the distrubion of R&D activies considering the instructions in Field of R&D Classification.)

Field of R&D	(%)
1. Natural sciences	
2. Engineering and technology	
3. Medical sciences	
4. Agricultural sciences	
5. Social sciences	
6. Humanities	
Total	100

5.2 Are your intramural R&D activities including biotechnology R&D?

Biotechnology: The application of science and technology to living organisms and / or parts, products and models of these organisms, products and services and for the exchange of living or non-living organisms, for the purpose of producing knowledge.

Yes 1 No 2 → Go to question 6.1.

5.2.1 Proportion of biotechnology R&D activities to intramural R&D activities (%)

Background information (some variables like turnover and economic activity obtained from other sources)

Main filter question

FORD

Biotechnology R&D

Bes-Questionnaire

6.1 Number of R&D personnel, time devoted to intramural R&D activities and R&D personel expenditures in 2019

R&D personnel expenditure with service procurement should be taken into consideration "Other Extramural Current Costs" Section.

(Please fill this table considering the detailed information in instructions.)

	Occupation and educational level	Number of full or part time R&D personnel in 2019			Aveage weekly working time (hour)	Average weekly time devoted to R&D activities (hour)	Average employer cost per person(*) (TL)	R&D personnel expenditure (TL)
		Female	Male	Total	Average hour for each line individually	Average hour for each line individually	Avarage employer cost per person for each line individually	[Column 3 x (Column 5 / Column 4) x Column 6]
		Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
A	Researchers							
1	Doctoral or equivalent level							
2	Master's or equivalent level							
3	Bachelor's or equivalent level							
4	Other tertiary level diplomas							
5	Post-secondary or equivalent level							
	TOTAL - A							
B	Technicians/ equivalent staff							
1	Doctoral or equivalent level							
2	Master's or equivalent level							
3	Bachelor's or equivalent level							
4	Other tertiary level diplomas							
5	Post-secondary or equivalent level							
98	Other							
	TOTAL - B							
C	Other supporting staff							
1	Doctoral or equivalent level							
2	Master's or equivalent level							
3	Bachelor's or equivalent level							
4	Other tertiary level diplomas							
5	Post-secondary or equivalent level							
98	Other							
	TOTAL - C							
	GENERAL TOTAL (A+B+C)					Total R&D expenditure for Labour cost in 2019		

(*) Average employer cost per person includes net payment, social security share for employee and employer, unemployment insurance for employee and employer, overtime, bonueses, compensation, social and public relief.

Number of R&D personnel

Calculating FTE values for each sub-group

Calculating FTE R&D personnel expenditure for each sub-group

Bes-Questionnaire

6.2. Distribution of your personnel who work full-time or part-time intramural R&D work by age group in 2019

(The total number of female and male personnel should be equal to the total number of female R&D personnel and the total number of male R&D personnel calculated at 6.1. The sum of the number of research male and female personnel must be equal to the total number of researchers in Table 6.1.A.)

R&D personnel age groups	Researcher R&D Staff			Total R&D Staff		
	Female	Male	Total	Female	Male	Total
Under 25						
25-34						
35-44						
45-54						
55-64						
At least 65						
Total						

7. Intramural R&D expenditures by the end of 2019 (TL)

7.1 Intramural R&D activities

(Fill in with the definitions given in the explanatory information for completing the questionnaire.)
(Funds for contractual research, including the same aid and payments, depreciation, except VAT and SCT.)
(Please round the kurus)

A. Current R&D expenditures	
A.1 R&D personnel expenditure (Question 6 should be equal to the "General Total" calculated in Column 7.)	
A.2 Other current costs	
A.2.1 External R&D personnel	
A.2.2 Purchase of services, excluding external R&D personnel	
A.2.3 Purchase of materials	
A.2.4 Other, not elsewhere classified	
B. R&D investment expenditures	
B.1 R&D Machinery equipment expenditures	
B.1.1 Information and communications equipment	
B.1.2 Transportation equipment	
B.1.3 Other machinery and equipment	
B.2 R&D fixed facility expenditures	
B.2.1 Land	
B.2.2 Buildings	
B.3 Capitalised computer software	
B.4 Other intellectual property products	
General Total	

7.2 R&D CENTER EXPENDITURES

How much of the internal R&D expenditure stated in 7.1 is carried out at the R&D center(s) of your enterprise? (TL)

8. Performed intramural R&D activities by type of activity in 2019

(Please fill this table considering the detailed information in instructions.)

Types of R&D activity		(%)
1. Basic research		
2. Applied research		
3. Experimental development		
3.1. Producing new materials, products or devices		
3.2. Improving existing products or services		
3.3. For the purpose of innovation in production methods		
	1+2+(3.1)+(3.2)+(3.3)	100

Age group of R&D personnel

R&D expenditures of the enterprise

Type of R&D

Bes-Questionnaire

9. The financial resources of intramural R&D expenditure that your venture has made in 2019 (TL)

	Exchange funds	Transfer funds
A. R&D expenditure made by your enterprise's budget (Including recycled loans and borrowing for use in R&D activities)		
B. Extramural R&D financial resources		
B.1 Financial and non-financial corporations (Financial corporations consist of all resident corporations that are principally engaged in providing financial services, including insurance and pension funding services, to other institutional units. Non-financial corporations are corporations whose principal activity is the production of market goods or non-financial services.)		
B.1.1 Other enterprises in the same group		
B.1.2 Other domestic enterprises		
B.2 General government (Government units are unique kinds of legal entities established by political processes that have legislative, judicial or executive authority over other institutional units within a given area. Viewed as institutional units, the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes, to redistribute income and wealth by means of transfers, and to engage in non-market production)		
B.2.1 Central government agencies		
B.2.2 Local agencies		
B.2.3 Other government agencies		
B.3 Higher education sector		
B.4 Private non-profit organisations		
B.5 Rest of the World		
B.5.1 Financial and non-financial corporations		
B.5.1.1 Other enterprises in the same group		
B.5.1.2 Other enterprises		
B.5.2 General government		
B.5.3 Higher education sector		
B.5.4 Private non-profit organisations		
B.5.5 EU Institutions		
B.5.6 International organisations (FAO,OECD etc.)		
General Total		

10. Intramural R&D expenditures carried out by your enterprise in 2019, the number of R&D personnel Please specify in cities where R&D activities are carried out.

(You can specify in the notes section on the last page if the number of illusions in which the R & D activity is carried out is more than 7.)

City	Researcher R&D staff		Total R&D staff		Total Intramural R&D expenditures (TL)
	Female	Male	Female	Male	
1.					
2.					
3.					
4.					
5.					
6.					
7.					
TOTAL					

(The sum of the number of personnel must be equal to the sum of the personnel given in Question 6.1, and the sum of expenditure must be equal to the sum given in Question 7).

Financial sources of R&D

Location of R&D activities for NUTS

GOV & PNP-Questionnaire

1. Did you carry out intramural R&D activities in 2019?

(Definitions regarding R&D is clarified in Instructions section.)

Yes ☐ 1 No ☐ 2 → Go to question 11

2. Socio economic objectives of your intramural R&D activities carried out in 2019 ?

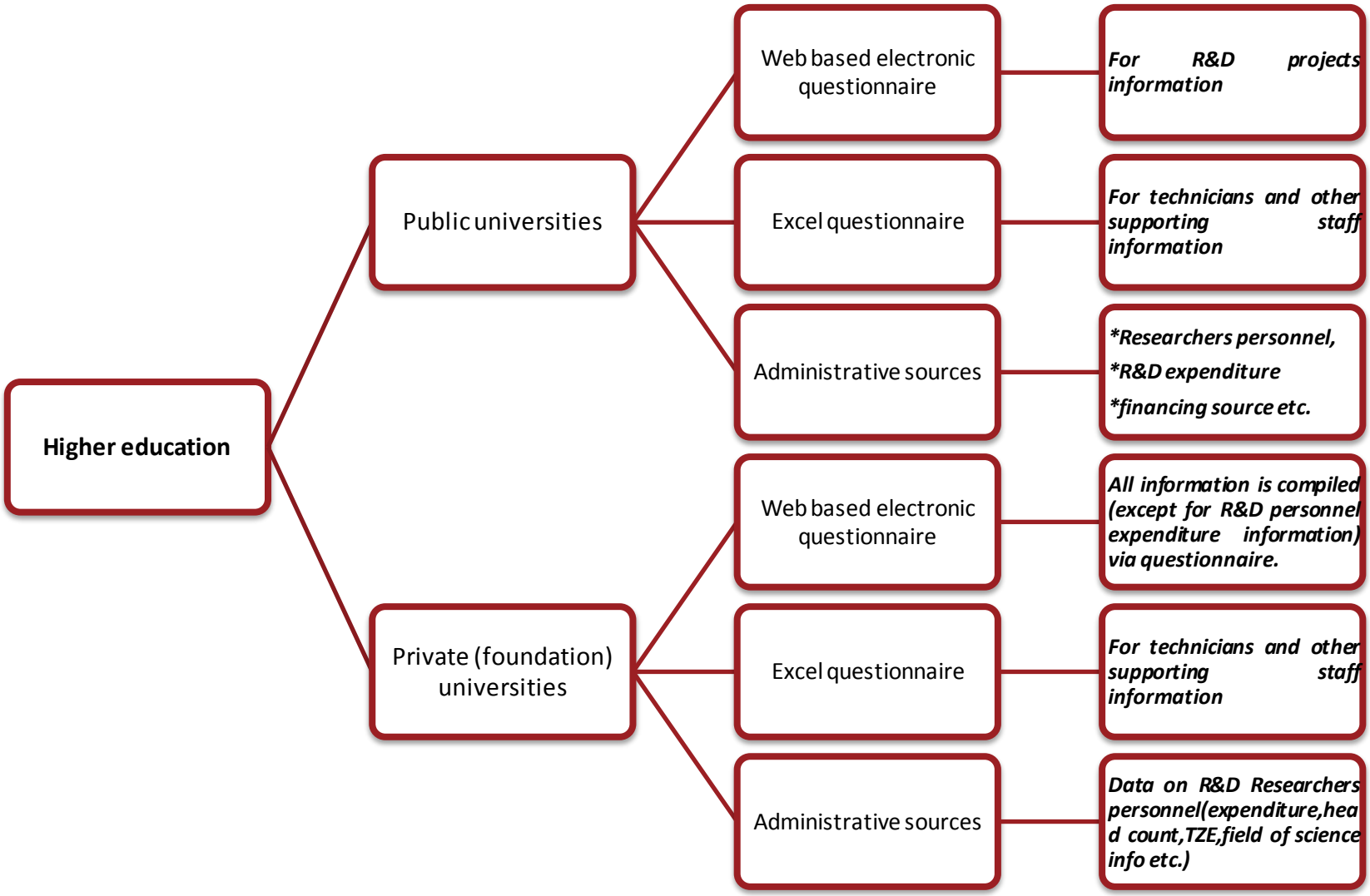
(Please fill the table according to NABS classification table given in the instructions)

Socio economic objectives	(%)
1. Exploration and exploitation of the earth	
2. Environment	
3. Exploration and exploitation of space	
4. Transport, telecommunication and other infrastructures	
5. Energy	
6. Industrial production and technology	
7. Health	
8. Agriculture	
9. Education	
10.Culture, recreation, religion and mass media	
11. Political and social systems, structures and processes	
12. General advancement of knowledge: R&D *(R&D financed from general university funds (GUF))*	
13. General advancement of knowledge: R&D *(R&D financed from other sources than GUF)*	
14. Defence	
Total	

Main difference derives from NABS.

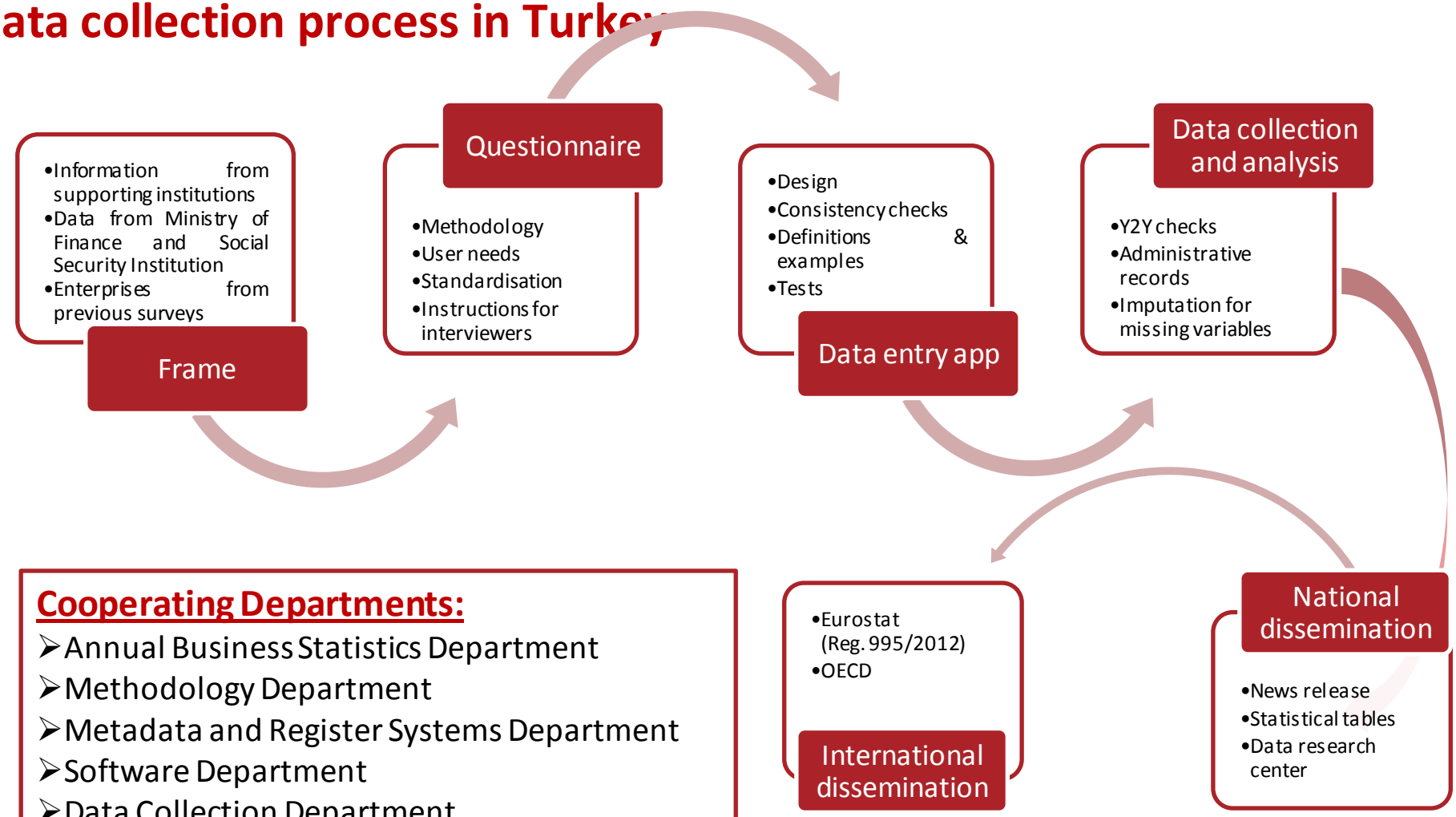
Press Release Table:
Government expenditure on R&D by socio-economic objectives and type of costs

HES-Data survey process



Data collection

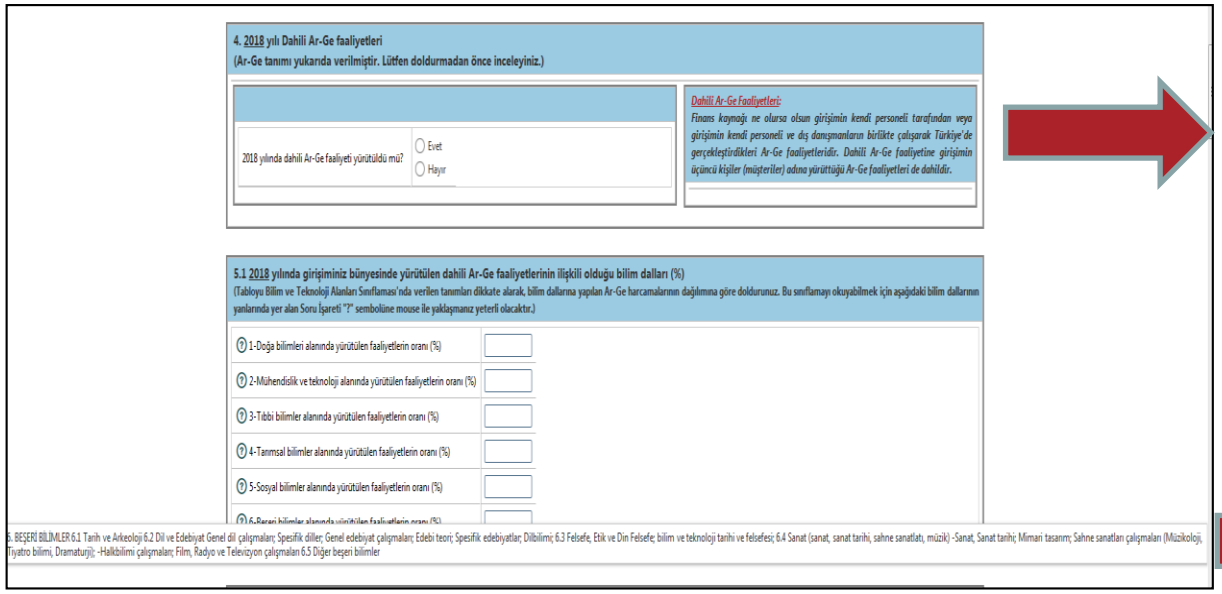
Data collection process in Turkey



Cooperating Departments:

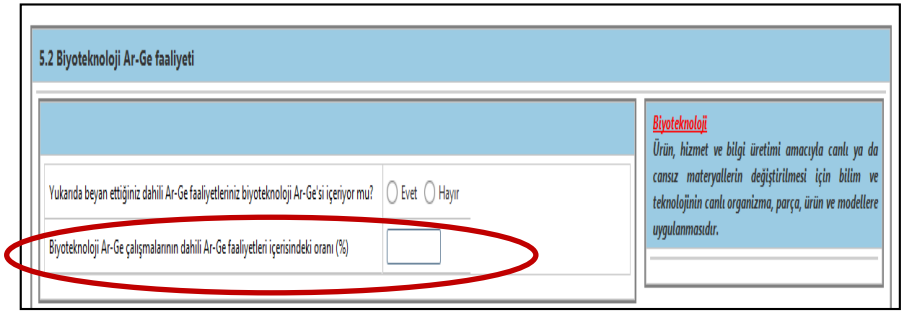
- Annual Business Statistics Department
- Methodology Department
- Metadata and Register Systems Department
- Software Department
- Data Collection Department
- Regional Organization

Standard perspective



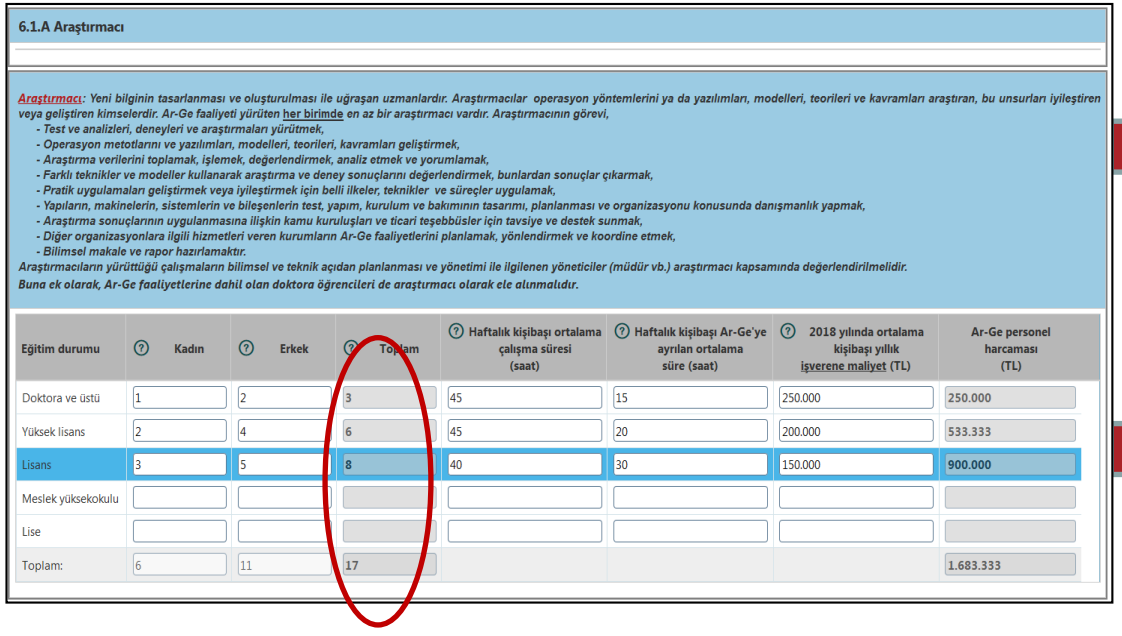
Definitions beyond the questions (nearly all the key and controversial ones)

User friendly pop-ups



Hide & show results for filter questions

Standard perspective



6.1.A Araştırmacı

Araştırmacı: Yeni bilginin tasarlanması ve oluşturulması ile uğraşan uzmanlardır. Araştırmacılar operasyon yöntemlerini ya da yazılımları, modelleri, teorileri ve kavramları araştıran, bu unsurları iyileştiren veya geliştiren kimselerdir. Ar-Ge faaliyeti yürüten her birimde en az bir araştırmacı vardır. Araştırmacının görevi,

- *Test ve analizleri, deneyleri ve araştırmaları yürütmek,*
- *Operasyon metotlarını ve yazılımları, modelleri, teorileri, kavramları geliştirmek,*
- *Araştırma verilerini toplamak, işlemek, değerlendirmek, analiz etmek ve yorumlamak,*
- *Farklı teknikler ve modeller kullanarak araştırma ve deney sonuçlarını değerlendirmek, bunlardan sonuçlar çıkarmak,*
- *Pratik uygulamaları geliştirmek veya iyileştirmek için belli ilkeler, teknikler ve süreçler uygulamak,*
- *Yapıların, makinelerin, sistemlerin ve bileşenlerin test, yapım, kurulum ve bakımının tasarımı, planlanması ve organizasyonu konusunda danışmanlık yapmak,*
- *Araştırma sonuçlarının uygulanmasına ilişkin kamu kuruluşları ve ticari teşebbüsler için tavsiye ve destek sunmak,*
- *Diğer organizasyonlara ilgili hizmetleri veren kurumların Ar-Ge faaliyetlerini planlamak, yönlendirmek ve koordine etmek,*
- *Bilimsel makale ve rapor hazırlamaktır.*

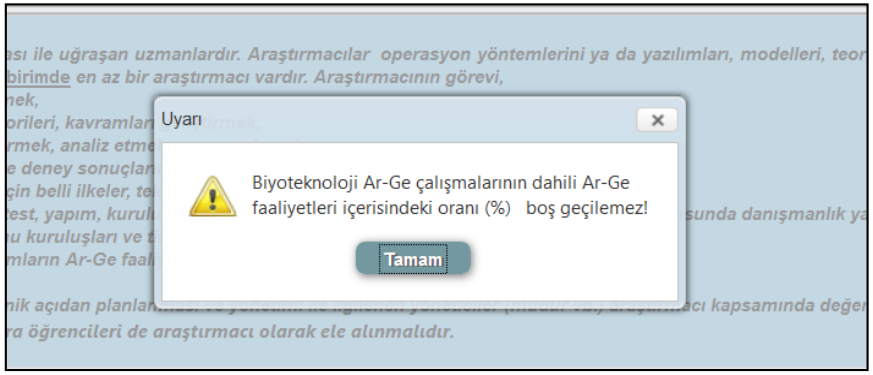
Araştırmacıların yürüttüğü çalışmaların bilimsel ve teknik açıdan planlanması ve yönetimi ile ilgilenen yöneticiler (müdür vb.) araştırmacı kapsamında değerlendirilmelidir.

Buna ek olarak, Ar-Ge faaliyetlerine dahil olan doktora öğrencileri de araştırmacı olarak ele alınmalıdır.

Eğitim durumu	Kadın	Erkek	Toplam	Haftalık kişibaşı ortalama çalışma süresi (saat)	Haftalık kişibaşı Ar-Ge'ye ayrılan ortalama süre (saat)	2018 yılında ortalama kişibaşı yıllık işverene maliyet (TL)	Ar-Ge personel harcaması (TL)
Doktora ve üstü	1	2	3	45	15	250.000	250.000
Yüksek lisans	2	4	6	45	20	200.000	533.333
Lisans	3	5	8	40	30	150.000	900.000
Meslek yüksekokulu							
Lise							
Toplam:	6	11	17				1.683.333

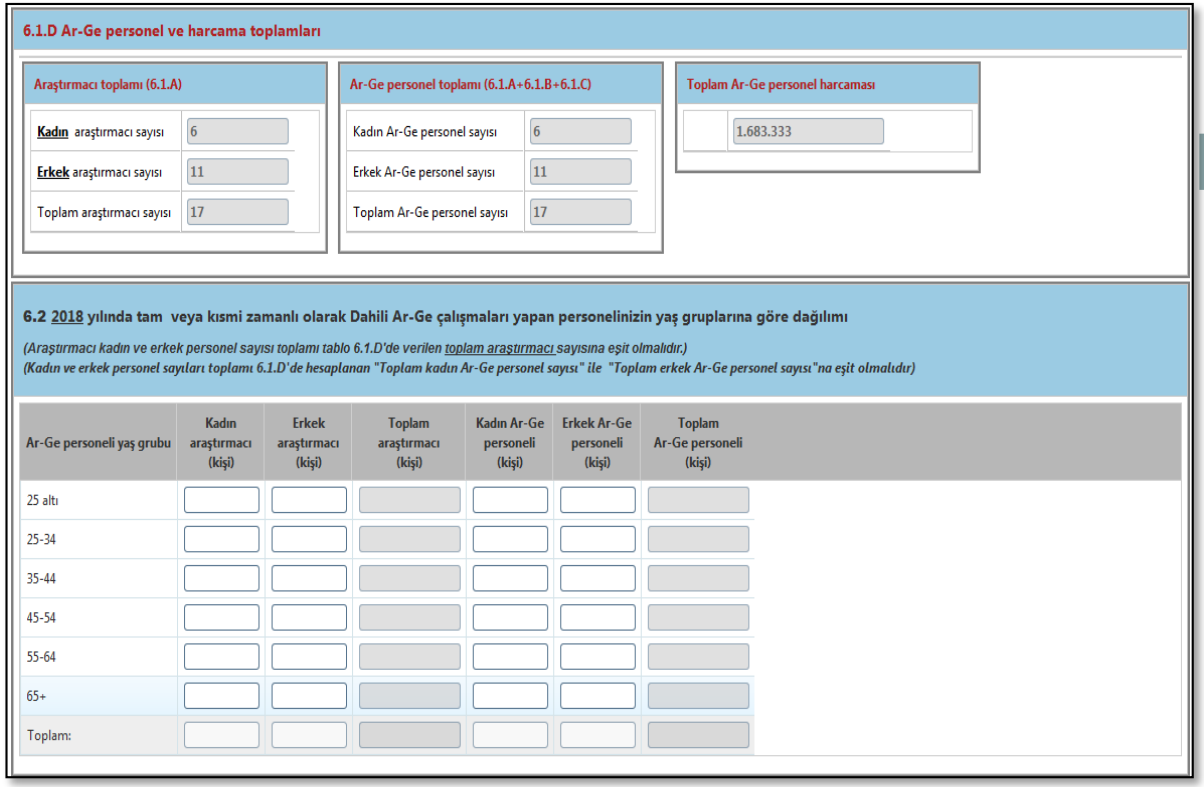
Examples of tasks performed by R&D personnel

Auto sum structure with read-only view



Simultaneous warnings that affects flow and cross checks in questionnaire

Standard perspective



6.1.D Ar-Ge personel ve harcama toplamları

Araştırmacı toplamı (6.1.A)	
Kadın araştırmacı sayısı	6
Erkek araştırmacı sayısı	11
Toplam araştırmacı sayısı	17

Ar-Ge personel toplamı (6.1.A+6.1.B+6.1.C)	
Kadın Ar-Ge personel sayısı	6
Erkek Ar-Ge personel sayısı	11
Toplam Ar-Ge personel sayısı	17

Toplam Ar-Ge personel harcaması
1.683.333

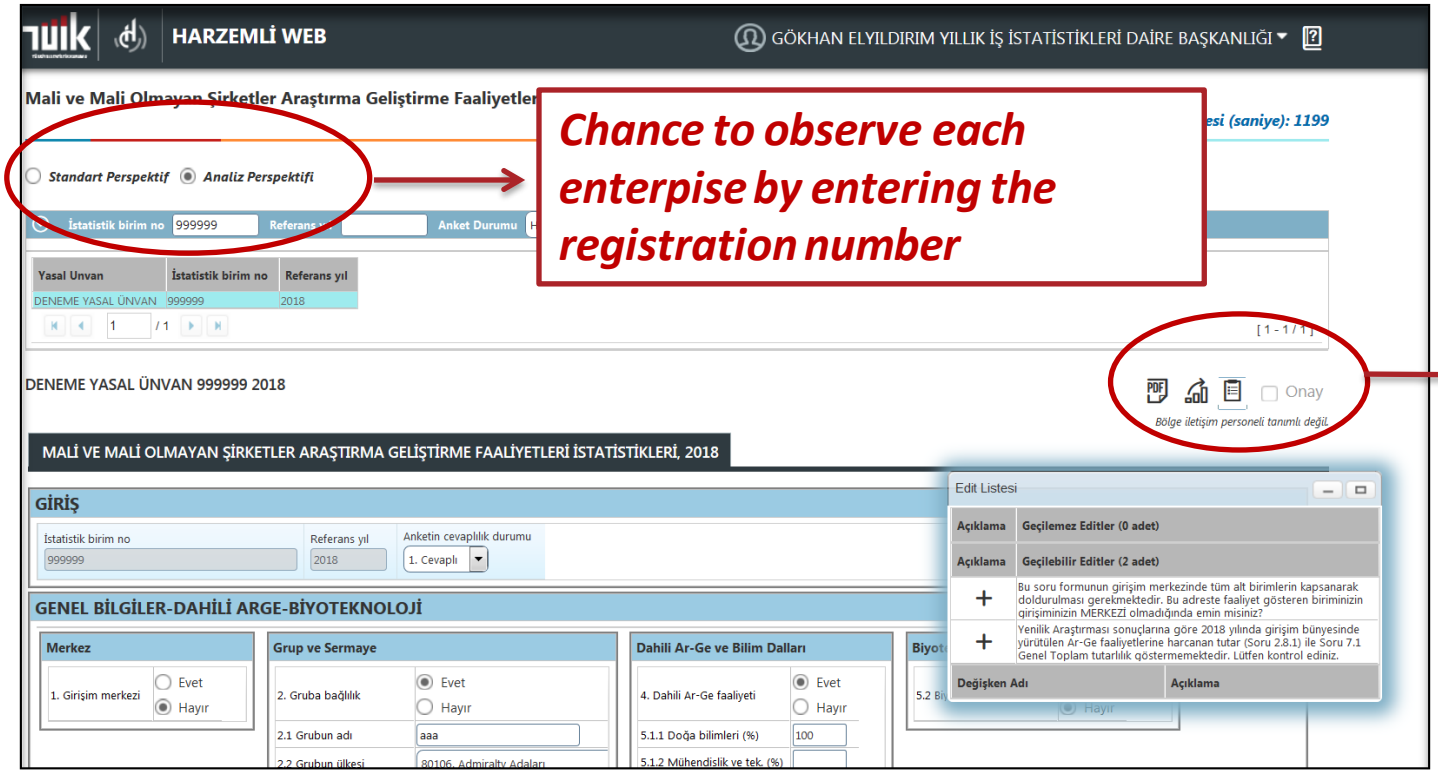
6.2 2018 yılında tam veya kısmi zamanlı olarak Dahili Ar-Ge çalışmaları yapan personelinizin yaş gruplarına göre dağılımı

(Araştırmacı kadın ve erkek personel sayısı toplamı tablo 6.1.D'de verilen toplam araştırmacı sayısına eşit olmalıdır.)
(Kadın ve erkek personel sayıları toplamı 6.1.D'de hesaplanan "Toplam kadın Ar-Ge personel sayısı" ile "Toplam erkek Ar-Ge personel sayısı"na eşit olmalıdır)

Ar-Ge personeli yaş grubu	Kadın araştırmacı (kişi)	Erkek araştırmacı (kişi)	Toplam araştırmacı (kişi)	Kadın Ar-Ge personeli (kişi)	Erkek Ar-Ge personeli (kişi)	Toplam Ar-Ge personeli (kişi)
25 altı						
25-34						
35-44						
45-54						
55-64						
65+						
Toplam:						

Auto filled tables to help users to distribute detailed breakdowns such as researchers for age groups

Analyze perspective

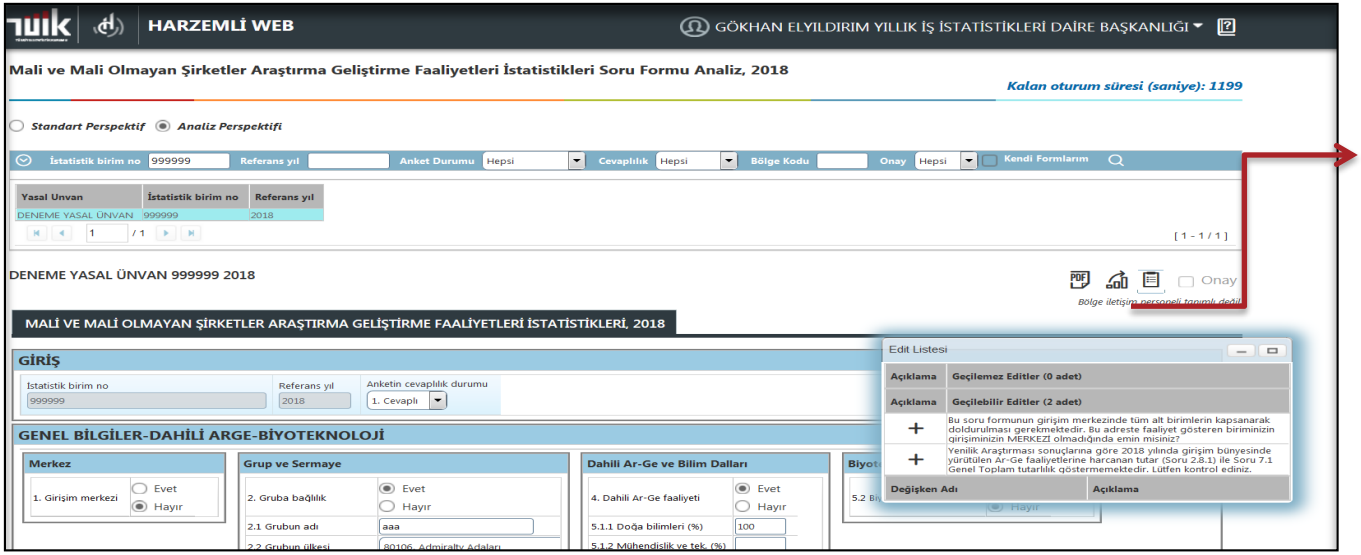


Chance to observe each enterprise by entering the registration number

Analyze & confirmation button, PDF print out option

Control and analyze process for central organization and regional offices. Authorized for specifics dates for offices, reporting option for regional and central bodies of TurkStat

Analyze perspective



Detailed explanations for regional offices about potential / soft and hard errors

- ✓ *Y2Y checks (R&D active firms)*
- ✓ *Compared with other surveys (Innovation, biotechnology)*
- ✓ *R&D expenditures compared with R&D deductions data from Ministry of Finance (enterprises benefit from R&D tax incentives and enterprises in Technology Development Zones and Technoparks)*
- ✓ *R&D expenditures compared with R&D grants data from supporting institutions*
- ✓ *R&D personnel compared with SSC exemptions data from Social Security Institution*
- ✓ *Financial sources compared with R&D grants data from supporting institutions*

Measurement and analysis

Measuring R&D

Survey or other sources?

1. **Statistics on R&D require regular, systematic and harmonised special surveys.**
2. **Administrative data may primary sources to provide information, but:**
   - *concepts of R&D used often different from Frascati Manual concepts*
   - *concepts may change over time*
   - *may not give the desired variables (Such as,FTE value)*
   - *may be used as an auxiliary source of information to assist in the imputation of missing or inconsistent information*
   - *administrative data may be used for sampling frame maintenance.*

   …
3. **Estimates are a necessary supplement to surveys**
   - *especially in higher education sector*

Measuring R&D

R&D surveys

1. Should identify and measure all financial and personnel resources devoted to all R&D activities in all R&D units, at all levels.
2. are mainly addressed to R&D-performing units.

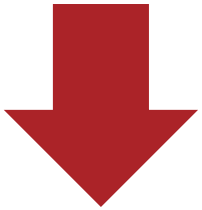
Questions

1. Which sectors are to be covered?: public and/or private? Business, Government, Higher education, Private non profit?
2. Method?: census, sample or purposive?
3. Who is the target of the survey? How to develop the survey registers?
4. Who will complete the survey questionnaire?
5. How the survey will be conducted? administrative interviews, postal, email correspondence, web based, etc.?

Measuring R&D: BES

Statistical unit: Enterprise

- Regular R&D performers (have separate R&D units)
- Occasional R&D performers



R&D surveys should include all.

The question: Who perform R&D?

Measuring R&D: BES, Survey approaches

1. Census-based survey of large enterprises and a sample of smaller ones

- Should be based on business register.
- Sample could belong to a certain population (in terms of economic activity ,size class..).
- This is the approach followed in innovation surveys.

Disadvantages:

- R&D performed in the past in the enterprise is not considered.
- Very small enterprises and enterprises in certain less R&D-intensive industries often excluded for cost reasons.
- When the sample size is very small, estimates may be less reliable, owing to raising factors.

Measuring R&D: BES, Survey approaches

2. Purposive survey on that deliberately sets out to identify R&D performers (i.e. cover all firms known or supposed to perform R&D)

Based on a business register of R&D performing enterprises:

- Registers of publicly funded research grants
- Lists of enterprises reporting R&D activities in previous R&D surveys, or in innovation surveys / enterprise surveys (SBS etc)
- Industrial research associations / Professional associations / Chamber of Commerce / Trade associations
- Company annual reports / Trade journals
- Lists of enterprises claiming tax deductions for R&D

Measuring R&D: BES, Survey approaches

3. Joint approach

Purposive survey

- *To include all firms known or supposed to perform R&D, based on a business register of R&D performing enterprises*

Census/sample of all other firms

- *To identify R&D performers not known or supposed to perform R&D*

- *In selected industries*
- *In principle, enterprises in all size classes should be included, but if a cut-off point is necessary, it should be at ten employees.*

Before the fieldwork (example in Turkey)

For the purpose of consistency check of respondent unit

- *Data entry program is prepared for queries and controls.*
- *Analyze perspective program is prepared for queries and controls.*
- *R&D project support information is received from Such as TUBİTAK, KOSGEB, TTGV for creating frame and using control purpose in fieldwork .*
- *Direct and indirect R&D support information are received from Ministry of Finance for creating frame and using control purpose in fieldwork .*
- *The information of enterprises that have applied for R&D projects but not accepted is also received from supporting institutions to control scope of the frame.*
- *SSC exemptions data related R&D personnel is received from Social Security Institution for creating frame and using control purpose in fieldwork.*
- *Other survey information is also used for creating frame and using control purpose in fieldwork . For example, Innovation, Biotechnology research..*

After the fieldwork (example in Turkey)

All suspicious or abnormal answer like the following are determined and transmitted to the Regional Offices for control purposes problems:

- *The enterprises whose R&D expenditure has decreased significantly despite the increase in the number of R&D personnel.*
- *Education levels of R&D personnel are different but the wages they receive are the same.*
- *The enterprises that have exactly the same answers in terms of expenditure with the previous year.*
- *The enterprises whose R&D expenditure distribution with significant deviation in term of capital or current R&D expenditure.*
- *The enterprises that have significant increase / decrease in their R&D expenditures compared to the previous years.*
- *The enterprises have not any R&D expenditure in the previous years but that have reached the top 1500 in terms of expenditure in the reference year.*
- *The enterprises whose R&D expenditures have increased significantly, despite the number of R&D personnel has decreased.*
- *The enterprises whose R&D expenditures have decreased significantly, despite the number of R&D personnel has increased.*
- *The enterprises whose number of Master's and Doctoral Researcher R&D staff has significantly decreased/increased (without project support.)*

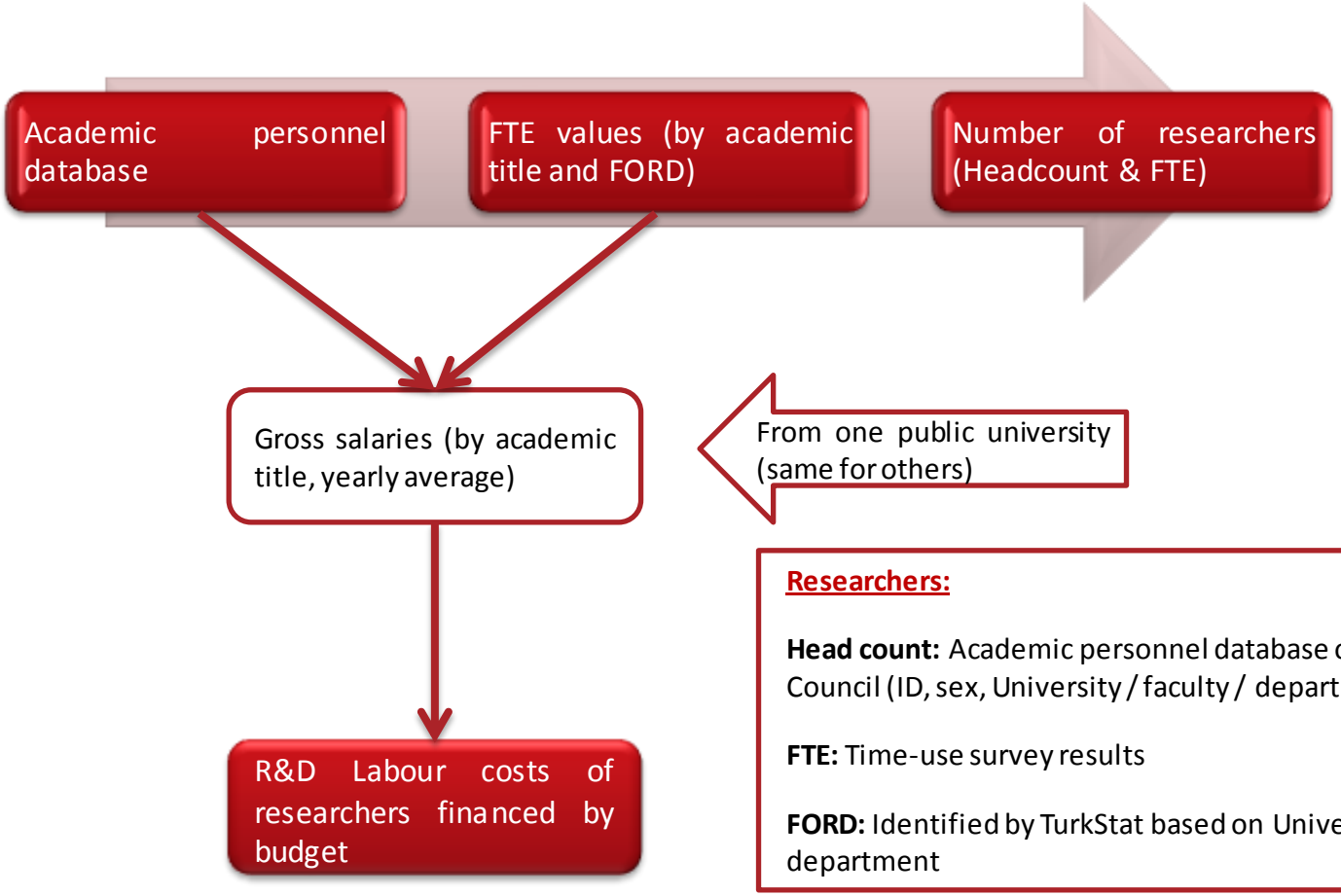
Data analysis phase (example in Turkey)

- *Completeness checks of the final data are made*
- *All queries from the analytical data via:*
  - *SAS Program*
  - *SQL Codes*
  - *Ms Excel*
- *Preparing press release and statistical tables according to:*
  - *Statistical Classification of Economic Activities in the European Community (NACE)*
  - *Socio-economic objectives classification (NABS)*
  - *International Standard Classification of Education (ISCED)*
  - *The Nomenclature of territorial units for statistics (NUTS-1 / NUTS-2)*
  - *Classification of Fields of Research and Development (FORD)*
  - *R&D personnel by function according to FM_2015 (OECD)*
- *The information note is prepared for general assessment*

Higher Education Sector

Data analysis phase for R&D Researchers (example in Turkey)

Labour costs: Researchers



Researchers:

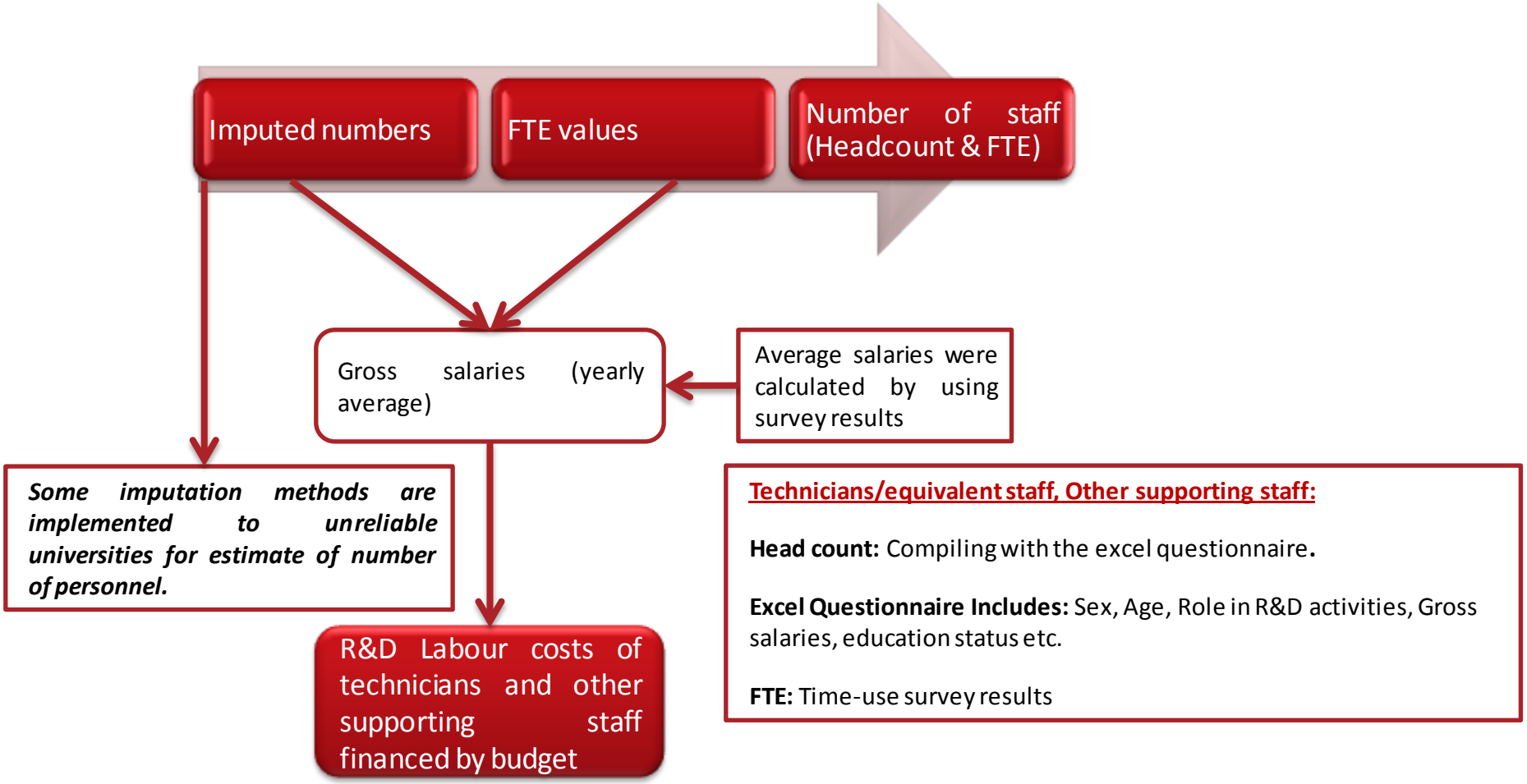
Head count: Academic personnel database of Higher Education Council (ID, sex, University / faculty / department etc.)

FTE: Time-use survey results

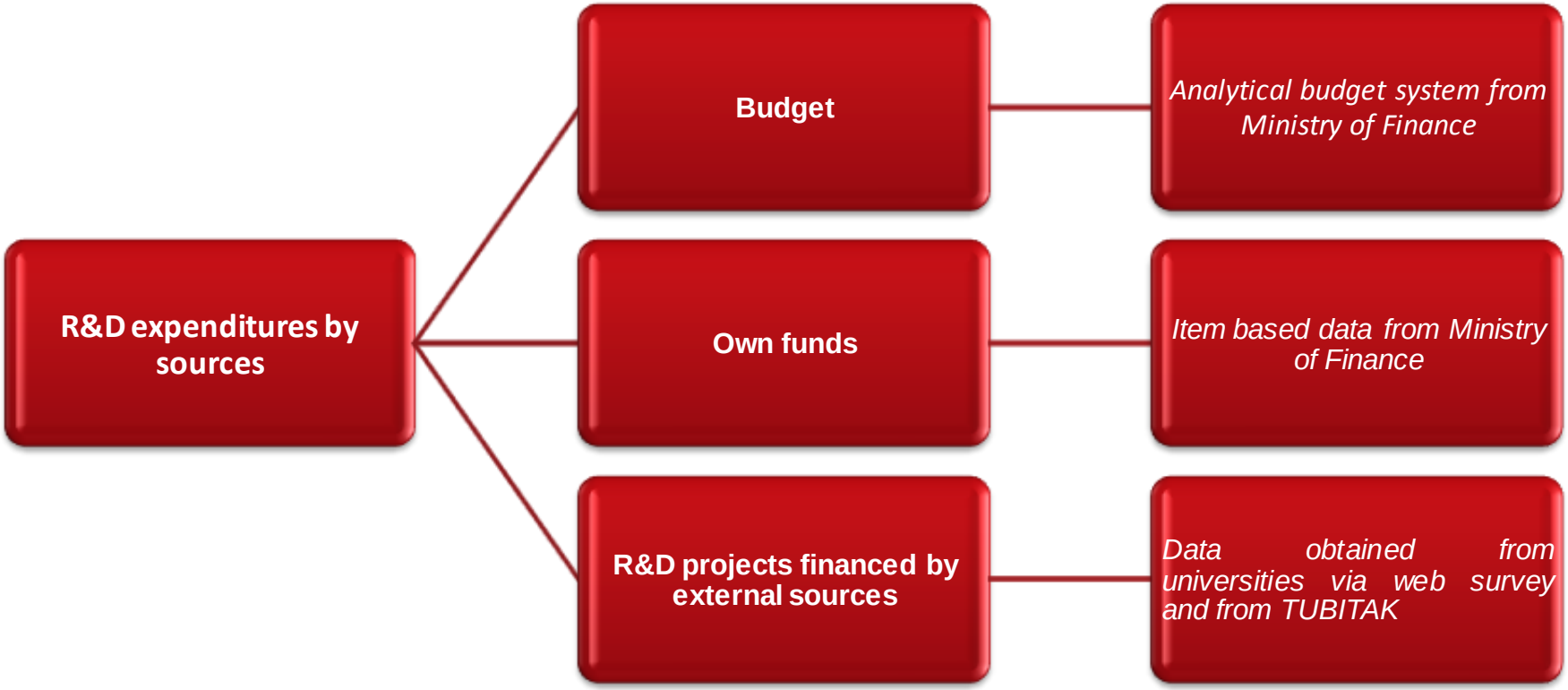
FORD: Identified by TurkStat based on University / faculty / department

Labour costs, R&D other staff (example in Turkey)

Labour costs: Technicians/equivalent staff, Other supporting staff



Current and investment expenditures (example in Turkey)



Current and investment expenditures (example in Turkey)

Indicators used to obtain a composite coefficient to calculate current and investment expenditures

1. **Number of doctorate students / Total number of students** → From Higher Education Council database — *Assumed that universities have more doctorate students are more R&D-intensive*

2. **R&D labour costs / Total labour costs** → R&D labour costs are calculated by Turkstat by using FTE values — *FTE values are available only academic title and FORD*

3. **R&D project expenditures / Total expenditures** → Scientific Research Projects data from universities and TUBITAK projects — *Assumed that universities have more R&D projects are more R&D-intensive*

4. **Budget Data**

5. **universities own funds**

The coefficient is used to calculate current and investment expenditures in Budget and universities own funds

6. **R&D projects financed by external sources** →

- *R&D project data compiled from administrative records*
- *R&D project data compiled with questionnaire*

Dissemination

Dissemination example in Turkey (Press release)

PRESS RELEASE

TÜRKİYE İSTATİSTİK KURUMU

TECHNICAL INFO
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/tuikbilgi /tuikbilgi

RELEASE DATE: 23 October 2020
HOURS: 10:00
NUMBER: 33676

TS33676

Research and Development Activities Survey, 2019

Gross domestic expenditure on R&D reached to 45 billion 954 million TRY

Gross domestic expenditure on research and development increased 7 billion 420 million TRY in Turkey and reached to 45 billion 954 million TRY in 2019.

Gross domestic expenditure on R&D, 2019

	Current prices (TRY)	Purchasing power parity (USD) [1]	USD [2]
Total gross domestic expenditure on R&D	45 953 691 096	24 974 832 117	8 092 433 187
GERD per capita [3]	556	302	98

(1) Purchasing power parity for 2019 (1 USD = 1,84 TRY)
(2) Import weighted exchange rate for 2019 (1 USD = 5.6786 TRY)
(3) Turkey population is 82 579 440. (Mid-year population estimation of 2019)

Tables

- **Table-1** Gross domestic expenditure on R&D by sector and type of cost
- **Table-2** Gross domestic expenditure on R&D by sector of performance and by source of funds
- **Table-3** R&D personnel by sector of performance and occupation
- **Table-4** R&D personnel by sector of performance and qualification
- **Table-5** R&D personnel by occupation and qualification
- **Table-6** General government expenditure on R&D by socio-economic objectives and type of costs
- **Table-7** Higher education expenditure on R&D by field of research and development and type of costs
- **Table-8** Financial and non-financial corporations expenditure on R&D by economic activities and type of costs
- **Table-9** Financial and non-financial corporations expenditure on R&D by source of funds
- **Table-10** Financial and non-financial corporations R&D personnel by economic activity and occupation
- **Table-11** Financial and non-financial corporations R&D personnel by economic activity and qualification
- **Table-12** R&D expenditure and personnel by classification of Statistical Regions (SR) Level-2
- **Table-13** Financial and non-financial corporations expenditure on R&D by size group and type of cost
- **Table-14** Financial and non-financial corporations R&D personnel by size group and occupation

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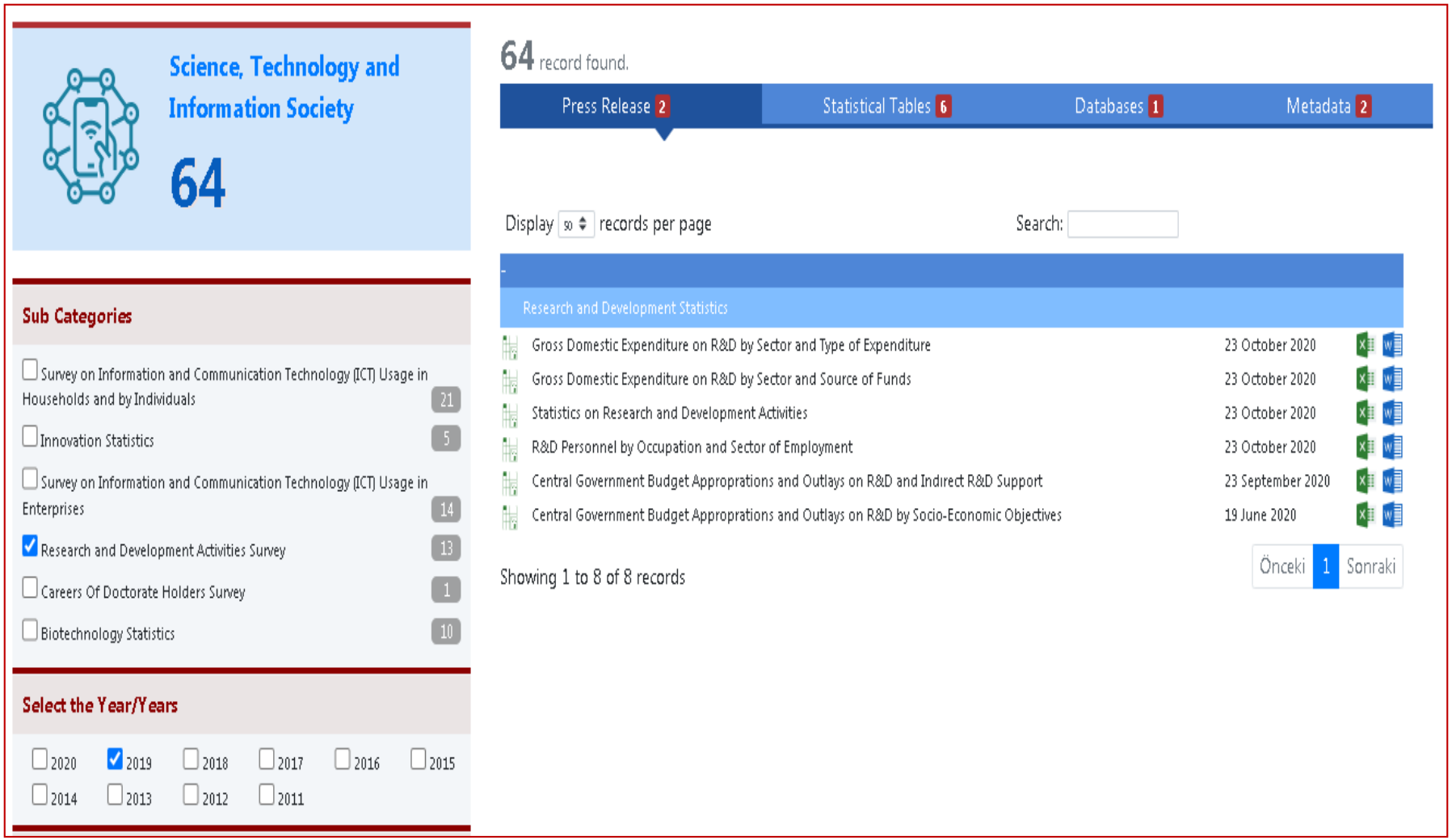
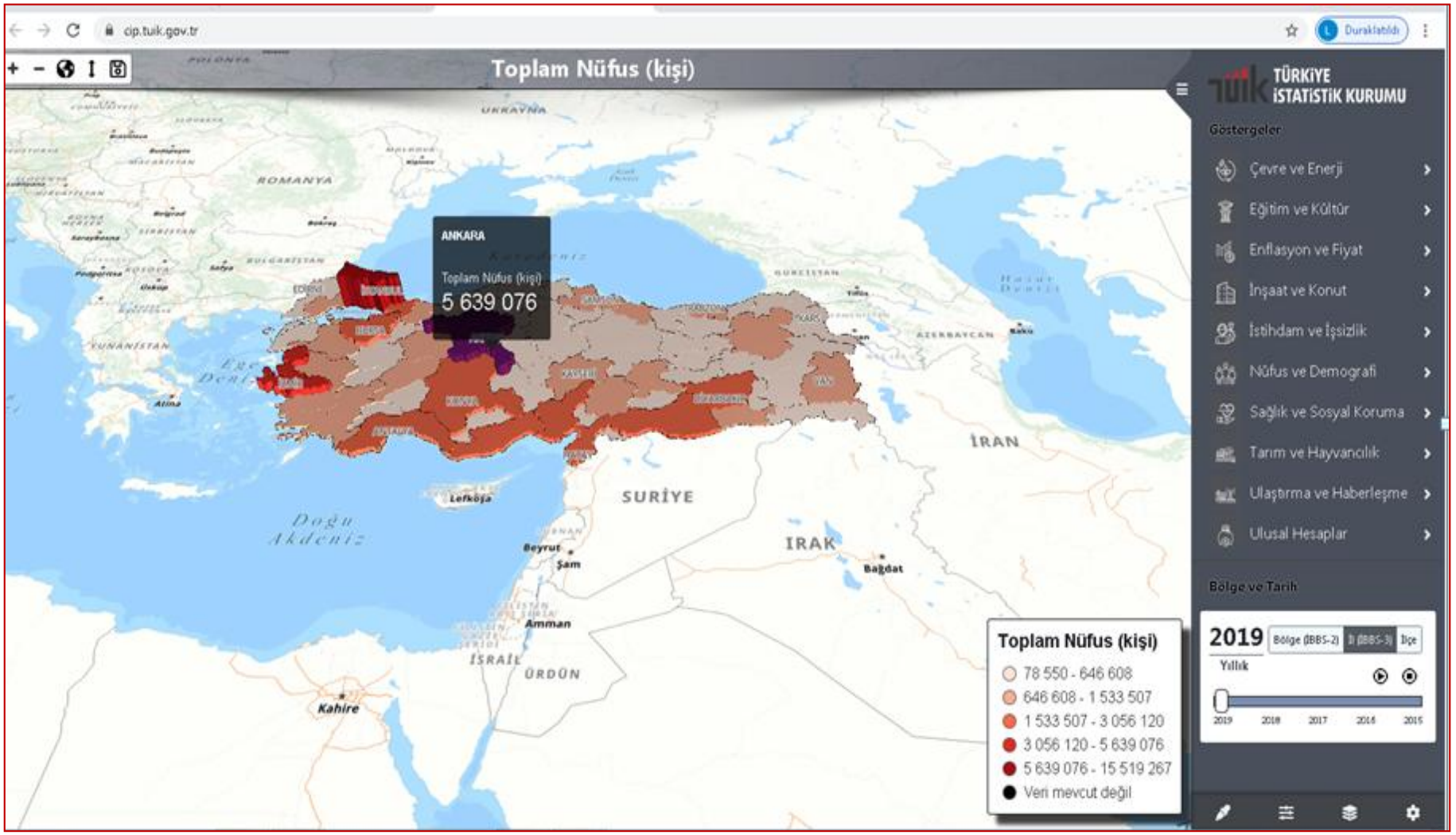
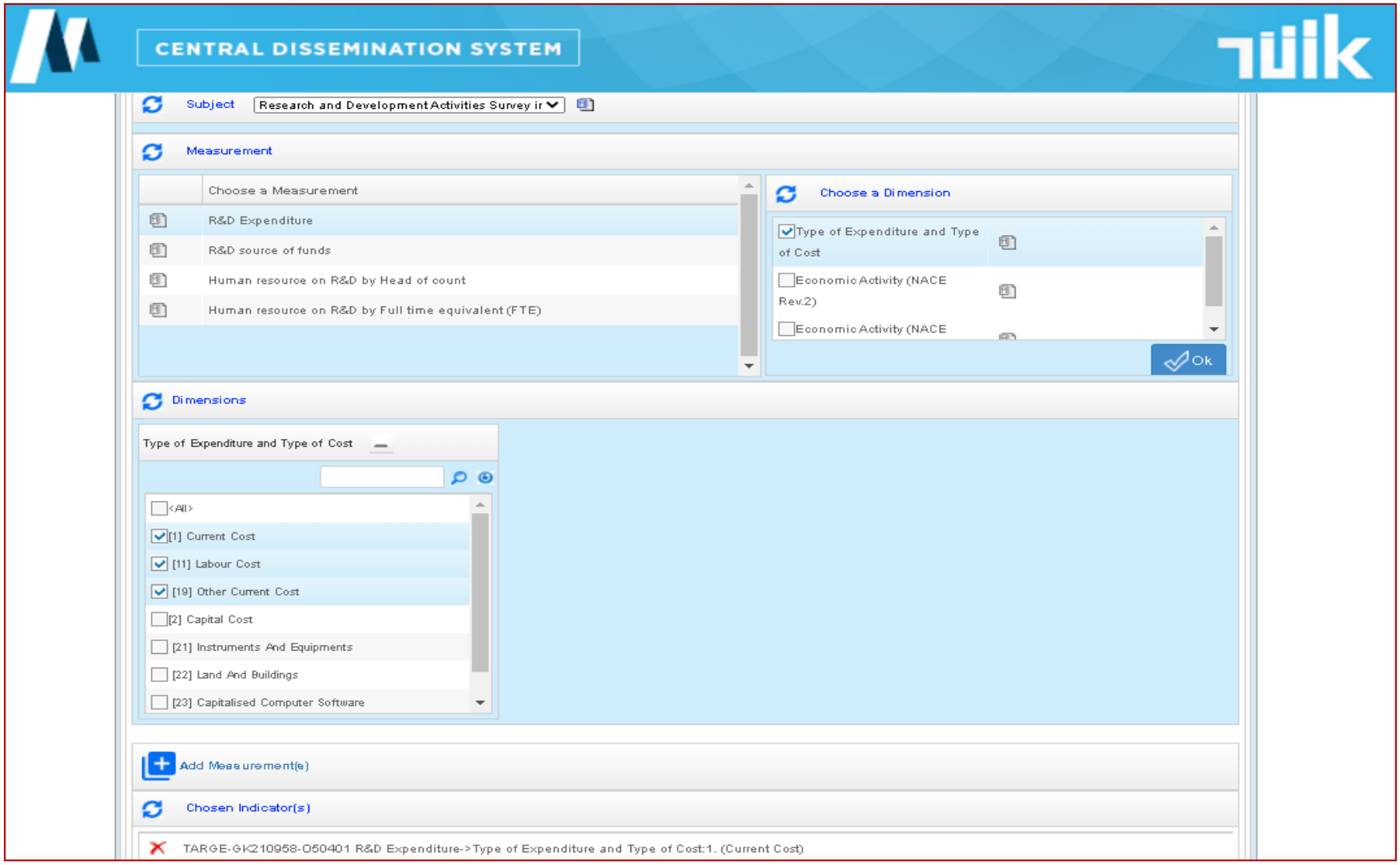
Dissemination example in Turkey (Statistical tables)



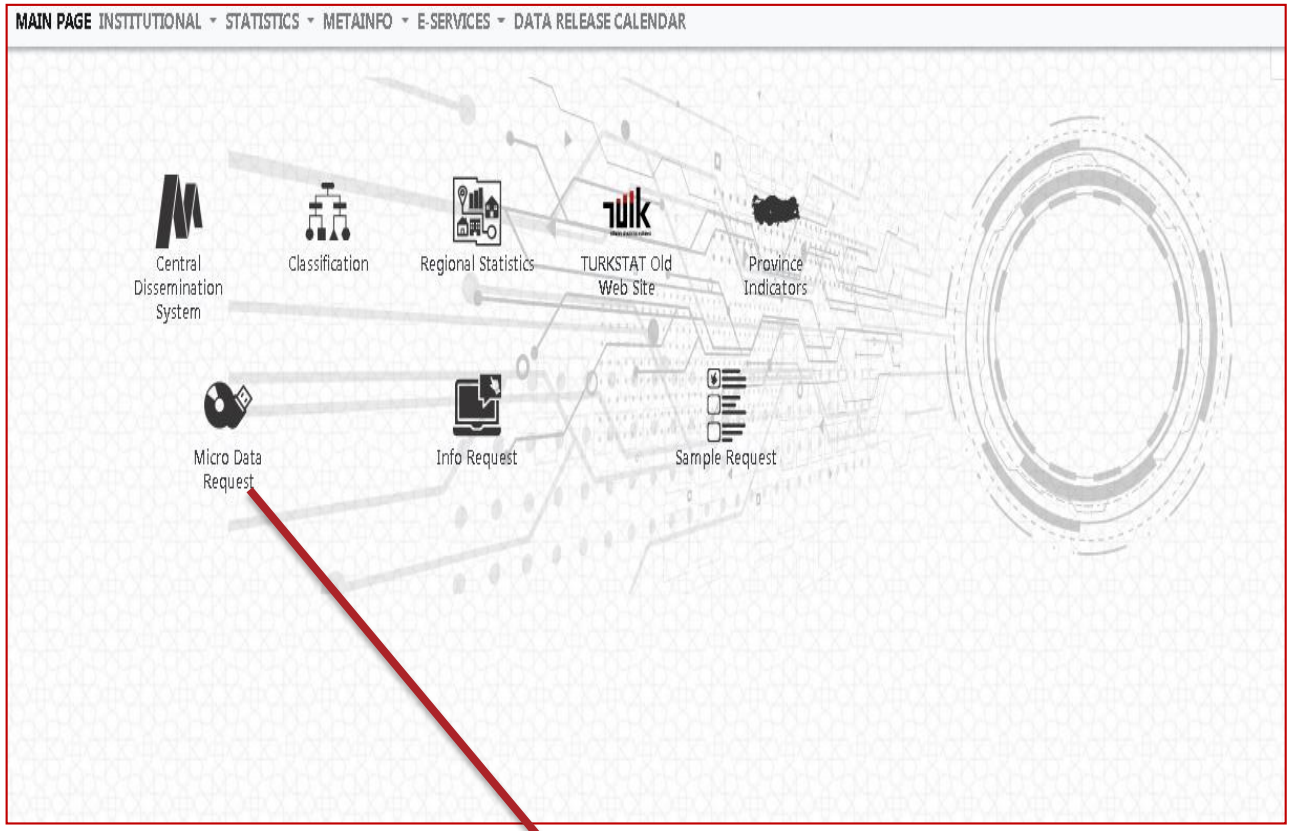
Dissemination example in Turkey (Geographic Statistics Portal)



Dissemination example in Turkey (Central Dissemination System

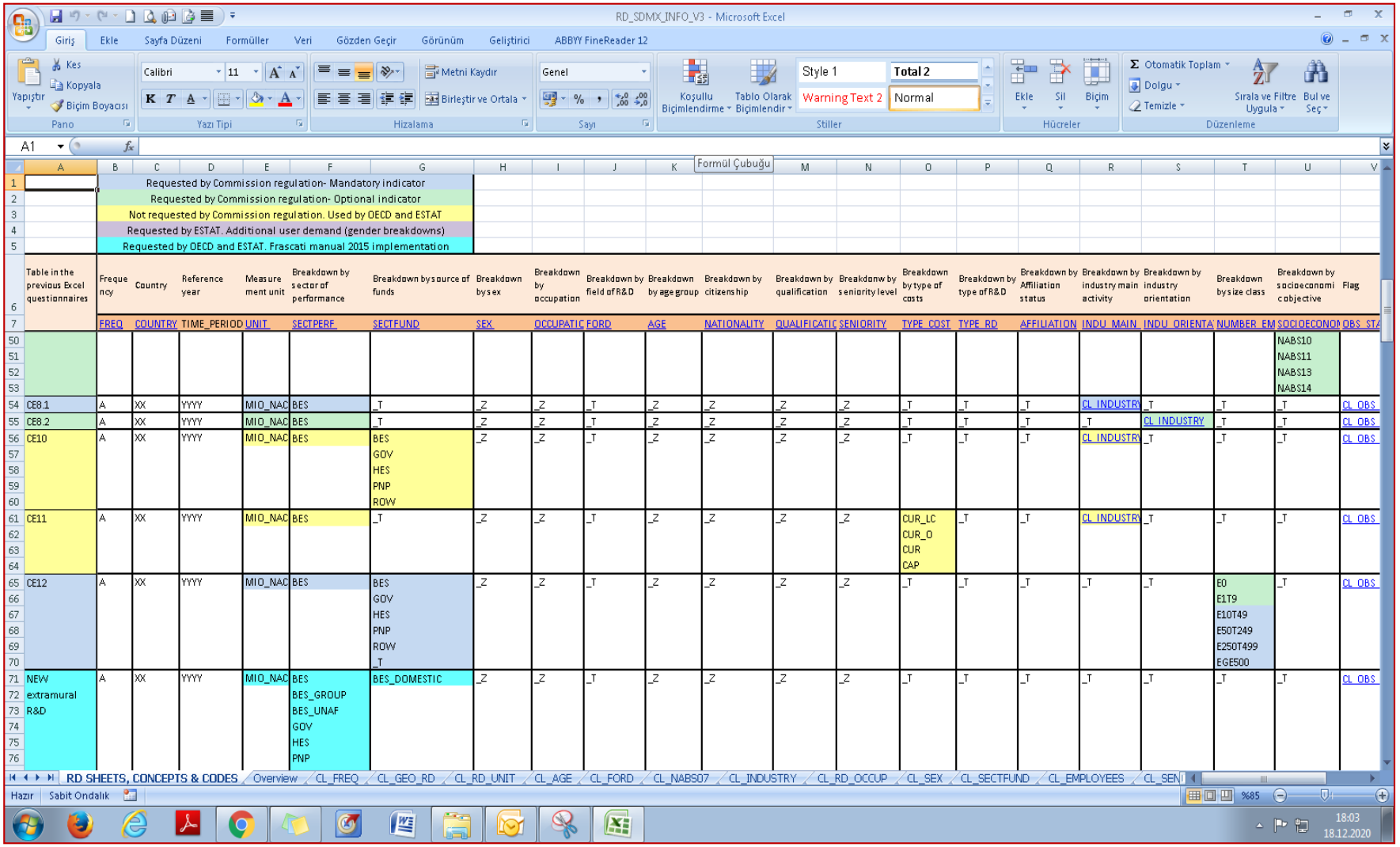


Dissemination example in Turkey (Data research center of Turkstat)



Privacy free data set and metadata is prepared and published for Research Data Center.

International Dissemination (Eurostat/OECD)



RD_SDMX_INFO_V3 - Microsoft Excel

Requested by Commission regulation- Mandatory indicator
Requested by Commission regulation- Optional indicator
Not requested by Commission regulation. Used by OECD and ESTAT
Requested by ESTAT. Additional user demand (gender breakdowns)
Requested by OECD and ESTAT. Frascati manual 2015 implementation

Table in the previous Excel questionnaires	Frequency	Country	Reference year	Measurement unit	Breakdown by sector of performance	Breakdown by source of funds	Breakdown by sex	Breakdown by occupation	Breakdown by field of R&D	Breakdown by age group	Breakdown by citizenship	Breakdown by qualification	Breakdown by seniority level	Breakdown by type of costs	Breakdown by type of R&D	Breakdown by Affiliation status	Breakdown by industry main activity	Breakdown by industry orientation	Breakdown by size class	Breakdown by socioeconomi cobjective	Flag
	FREQ	COUNTRY	TIME_PERIOD	UNIT	SECTPERF	SECTFUND	SEX	OCCUPATIC	FORD	AGE	NATIONALITY	QUALIFICATIC	SENIORITY	TYPE_COST	TYPE_RD	AFFILIATION	INDU_MAIN	INDU_ORIENTA	NUMBER_EM	SOCIOECONOM	OBS_STA
																				NABS10 NABS11 NABS13 NABS14	
CE8.1	A	XX	YYYY	MIO_NAC	BES	_T	_Z	_Z	_T	_Z	_Z	_Z	_Z	_T	_T	_T	CL_INDUSTRY	_T	_T	_T	CL_OBS
CE8.2	A	XX	YYYY	MIO_NAC	BES	_T	_Z	_Z	_T	_Z	_Z	_Z	_Z	_T	_T	_T	_T	CL_INDUSTRY	_T	_T	CL_OBS
CE10	A	XX	YYYY	MIO_NAC	BES	BES GOV HES PNP ROW	_Z	_Z	_T	_Z	_Z	_Z	_Z	_T	_T	_T	CL_INDUSTRY	_T	_T	_T	CL_OBS
CE11	A	XX	YYYY	MIO_NAC	BES	_T	_Z	_Z	_T	_Z	_Z	_Z	_Z	CUR_LC CUR_O CUR CAP	_T	_T	CL_INDUSTRY	_T	_T	_T	CL_OBS
CE12	A	XX	YYYY	MIO_NAC	BES	BES GOV HES PNP ROW _T	_Z	_Z	_T	_Z	_Z	_Z	_Z	_T	_T	_T	_T	_T	E0 E1T9 E10T49 E50T249 E250T499 EGE500	_T	CL_OBS
NEW extramural R&D	A	XX	YYYY	MIO_NAC	BES BES_GROUP BES_UNAF GOV HES PNP	BES_DOMESTIC	_Z	_Z	_T	_Z	_Z	_Z	_Z	_T	_T	_T	_T	_T	_T	_T	CL_OBS

RD SHEETS, CONCEPTS & CODES | Overview | CL_FREQ | CL_GEO_RD | CL_RD_UNIT | CL_AGE | CL_FORD | CL_NABS07 | CL_INDUSTRY | CL_RD_OCCUP | CL_SEX | CL_SECTFUND | CL_EMPLOYEES | CL_SEN

International Dissemination

- **OECD**
  - *Science, Technology and Industry Scoreboard*
  - *Main Science and Technology Indicators*
  - *OECD Science, Technology and Industry Outlook*
  - *Research and Development Statistics (RDS)*
- **Eurostat**
  - *Science, technology and innovation in Europe*
  - *Science, and technology database*

Quality report

- Contact
- Metadata update
- Statistical presentation
- Unit of measure
- Reference Period
- Institutional Mandate
- Confidentiality
- Release policy
- Frequency of dissemination
- Accessibility and clarity
- Quality management
- Relevance
- Accuracy
- Timeliness and punctuality
- Coherence and comparability
- Cost and Burden
- Data revision
- Statistical processing

Thank you…

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